



United States  
Department of  
Agriculture



Natural  
Resources  
Conservation  
Service



United States  
Department of  
the Interior



National Park Service

in cooperation with  
Mojave Desert Resource  
Conservation District

# Soil Survey of Joshua Tree National Park, California









# How To Use This Soil Survey

## General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

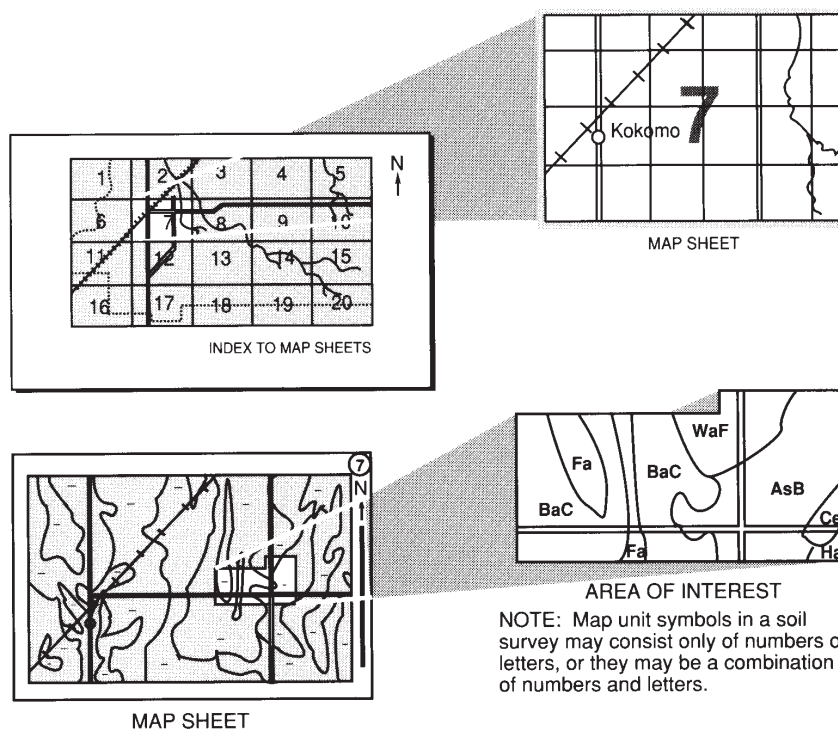
## Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.





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## National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the United States Department of Agriculture, Natural Resources Conservation Service; the United States Department of the Interior, National Park Service; and the Mojave Desert Resource Conservation District. The survey is part of the technical assistance furnished to the National Park Service.

Major fieldwork for this soil survey was completed in 2012. Soil names and descriptions were approved in 2012. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2012. The most current official data are available on the Internet.

The soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, the maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

## Literature Citation

The correct citation for this survey is as follows:

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## Cover Caption

A rock outcropping of monzogranite in an area of Smithcanyon-Stubbesspring-Rock outcrop complex, 15 to 50 percent slopes, in the northwest corner of Joshua Tree National Park.

*Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at <http://www.nrcs.usda.gov/>.*



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# Preface

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This soil survey was developed in conjunction with the National Park Service's Soil Inventory and Monitoring Program and is intended to serve as the official source document for soils occurring within Joshua Tree National Park.

This soil survey contains information that affects current and future land use planning in the park. It contains predictions of soil behavior for selected land uses. The survey highlights soil limitations, actions needed to overcome the limitations, and the impact of selected land uses on the environment. It is designed to meet the needs of the National Park Service and its partners to better understand the properties of the soils in the park and the effects of these soil properties on various natural ecological characteristics. This knowledge can help the National Park Service and its partners to understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each map unit is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or Joshua Tree National Park.



**Location of Joshua Tree National Park in California**

# Soil Survey of Joshua Tree National Park, California

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in cooperation with  
Mojave Desert Resource Conservation District

JOSHUA TREE NATIONAL PARK sits astride the boundary of San Bernardino and  
Riverside Counties, California. The park lies about 225 kilometers (140 miles) east of  
Los Angeles, California and about 350 kilometers (215 miles) southwest of Las Vegas,  
Nevada. The cities of Indio and Palm Springs, California are within 40 kilometers  
(25 miles) south and southwest of the park, and the towns of Twentynine Palms and  
Joshua Tree are directly outside the park to the north. The survey area has a total of  
about 794,000 acres.

The survey area is in two major land resource areas—MLRA 30 (Mojave Desert)  
and MLRA 31 (Lower Colorado Desert).

## General Nature of the Survey Area

This section provides general information about the survey area. It discusses major  
land resource areas and climate.

## Major Land Resource Areas

The United States is subdivided into a number of land resource regions (LRR)  
that are made up of many major land resource areas (MLRA). Areas of an LRR have  
similar climate, soils, and land uses. An LRR typically covers three to five or more  
States. Its extent and boundary are largely determined by the dominant land use of  
that region; however, geology, climate, soils, and other natural resource factors are  
also considered. As a subdivision of an LRR, an MLRA is smaller in size (sometimes  
contained within a portion of one to several States) and is also determined in part  
based on land use. However, the geology, climate, soils, dominant plants, and other  
natural resource factors are examined more closely when determining the extent and  
boundary of an MLRA.

### **MLRA 30, Mojave Desert**

Almost the entire survey area is in MLRA 30. The only part that is not considered part of MLRA 30 is along the southern boundary, south of the Cottonwood, Eagle, and Coxcomb Mountains. In the park, this MLRA is characterized by the White Tank monzogranite formation that spans most of the northwest portion of the park and the alluvial material that has filled in around the pediments and hills in that area; the Little San Bernardino Mountains in the southwest portion of the park; the broad fan piedmonts in Pleasant Valley, the Hexie Mountains, and Pinto Basin in the northern portion; and Cottonwood Basin in the southern portion. The natural vegetation is mainly creosote bush, burrobush, Joshua tree, and big galleta at the lower elevations and blackbrush, California juniper, and pinyon pine at the higher elevations. Elevations range from approximately 1,000 to 5,800 feet. The average annual precipitation is 3 to 7 inches but can range as high as 10 inches at the higher elevations in the mountains on the west side of the park. The average annual air temperature ranges from 55 to 73 degrees F, and the frost-free period is 210 to 340 days.

### **MLRA 31, Lower Colorado Desert**

In the park, MLRA 31 includes only the fan piedmonts south of the Cottonwood, Eagle, and Coxcomb Mountains, such as the alluvial fans and drainageways adjacent to the southern exit of the park along Cottonwood Springs Road. This MLRA is characterized by extreme aridity and extreme soil and air temperatures. The Colorado Desert is hotter than most of the Mojave Desert, has only rare incidences of freezing, and receives a greater proportion of summer precipitation (July to September) than MLRA 30 because of monsoons from the southeast. Plant species considered indicators of the Colorado Desert include blue paloverde and desert ironwood. Elevations range from approximately 390 feet at the lowest point to 2,700 feet within the southern mountain ranges of the park. The average annual precipitation ranges from 2 to 6 inches. Precipitation is bimodal; approximately 20 to 40 percent of the annual precipitation falls between July and October. The average annual air temperature ranges from 73 to 79 degrees F, and the frost-free period is 360 to 365 days.

## **Climate**

Tables 1A through 1C give data on temperature and precipitation for the survey area as recorded at Hayfield Reservoir in the period 1933 to 2012, at Joshua Tree in the period 1959 to 2012, and at Twentynine Palms in the period 1935 to 2012. These three stations were used to show the variability in the survey area from the northwest edge of the park (Joshua Tree), to the northeastern edge of the park (Twentynine Palms), to the southernmost area of the park (Hayfield Reservoir).

In winter, the average temperatures range from 65.0 degrees F in Joshua Tree to 69.9 degrees F in Hayfield Reservoir. The average monthly minimum ranges from 50.7 degrees F in Joshua Tree to 55.2 degrees F in Hayfield Reservoir. The lowest temperature on record, which occurred at Twentynine Palms on July 11, 1961, is 10 degrees F. The average daily maximum temperature ranges from 79.3 degrees F in Joshua Tree to 84.6 degrees F in Hayfield Reservoir.

The average annual total precipitation ranges from 4.67 inches in Joshua Tree to 4.14 inches in Hayfield Reservoir. In Joshua Tree, 1.12 inches, or about 24 percent of the average, usually falls in July through September. In Hayfield Reservoir, 1.22 inches, or about 30 percent of the average, usually falls in July through September. Summer convection storms are common throughout the Mojave and Lower Colorado Deserts. Rain regularly falls starting in July, and larger rainfall events occur annually between August and September.



The average annual snowfall ranges from 2.0 inches at Joshua Tree to 0.1 inch at Hayfield Reservoir. The greatest snowfall amount in any one month during the period of record was 8.7 inches, recorded in 1974 at Joshua Tree.

## How This Survey Was Made

This survey was made in conjunction with the National Park Service's Soil Inventory and Monitoring Program to provide information about the soils and miscellaneous areas within Joshua Tree National Park. A scoping meeting with park staff was held in November 2006 to identify the soil resource information needs and to relate those needs to the existing soil survey. Of particular importance to park staff was information regarding the ecological significance and diversity of soil properties and ecological sites associated with desert pavement as well as the potential management concerns regarding accelerated rates of soil erosion, increased dust emissions, and potential changes in plant communities if areas of desert pavement are disturbed.

The Joshua Tree National Park soil survey was initiated in 2006. Fieldwork for the project commenced in February 2007. Fieldwork continued in until January 2011 and concentrated on looking at areas of concern pointed out by the Joshua Tree National Park staff. This work involved establishing new series for broadly defined components.

During the soil survey, ecological site and soil component relationships were observed. Soil-site correlation concepts were established to help in designing the map units. Soil and plant specialists tested the concepts during mapping and collected field documentation at numerous points across the landscape.

The information in this report includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil Taxonomy, the system of taxonomic

classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on ecological sites under defined levels of management are assembled from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they delineated the boundaries of these bodies on digital imagery and identified each as a specific map unit.

# General Soil Map Units

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The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

## Soils on Fan Piedmonts

### 1. Rizzo-Carsitas

*Very deep, sandy-skeletal or sandy soils that formed in alluvium from granitoid or gneissic rocks; on extreme hyperthermic, low-elevation alluvial fans, fan aprons, and drainageways along the southern boundary of the park*

#### Setting

*Landform:* Alluvial fans, fan aprons, inset fans, and drainageways

*Slope:* 0 to 15 percent

*Elevation:* 540 to 2,890 feet

*Annual air temperature:* 73 to 79 degrees F

*Average annual frost-free days:* 360 to 365 days

#### Composition

*Extent of the map unit within the survey area:* 2 percent

*Extent of the major components within the map unit:*

Rizzo and similar soils—60 percent

Carsitas and similar soils—36 percent

*Extent of the minor components within the map unit:*

Deprave and similar soils—3 percent

Rockhound and similar soils—1 percent

#### Soil Properties and Qualities

##### Rizzo soils

*Depth class:* Very deep

*Drainage class:* Excessively drained

## Soil Survey of Joshua Tree National Park, California

*Position on landform:* Fan aprons and drainageways

*Parent material:* Recent alluvium from granitoid and/or gneiss

*Texture of the surface layer:* Fine sandy loam, coarse sandy loam, or loamy coarse sand

*Slope:* 2 to 15 percent

*Typical vegetation:* On fan aprons—creosote bush, sowthistle dandelion, and Schott's dalea; in drainageways—burrobush, blue paloverde, and desert ironwood

### **Carsitas soils**

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Position on landform:* Alluvial fans and drainageways

*Parent material:* Recent alluvium from granitoid and/or gneiss

*Texture of the surface layer:* Sand or sandy loam

*Slope:* 0 to 8 percent

*Typical vegetation:* Desert willow, blue paloverde, Schott's dalea, burrobush, and brittlebush

### **Minor Components**

- Deprave and Rockhound soils on fan remnants

### **Use and Management**

**Major uses:** Recreation and wildlife habitat

#### **Recreation**

*Management concerns:*

- Because of excessive amounts of sand and minimal vegetation, dustiness is a concern when the soils are dry in areas that are subject to vehicular traffic.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting traffic to previously established trails.

#### **Wildlife habitat**

*Management concerns:*

- These soils are poorly suited to habitat for desert tortoises and other burrowing animals because of low soil strength due to excessive amounts of sand and gravel in the surface layer.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

## **2. Dalelake-Pintobasin**

*Very deep, eolian-deposited soils from granitoid and/or igneous sources intermixed with very deep, alluvial soils from granitoid and gneiss; on hyperthermic sand sheets interspersed with fan aprons in the northeast corner of the park and along the eastern edge of Pinto Basin*

### **Setting**

*Landform:* Sand sheets and fan aprons

*Slope:* 0 to 30 percent

*Elevation:* 705 to 2,200 feet



## Soil Survey of Joshua Tree National Park, California

*Annual air temperature:* 68 to 73 degrees F

*Average annual frost-free days:* 300 to 340 days

### Composition

*Extent of the map unit within the survey area:* 1 percent

*Extent of the major components within the map unit:*

Dalelake and similar soils—69 percent

Pintobasin and similar soils—24 percent

*Extent of the minor components within the map unit:*

Rock outcrop—3.5 percent

Buzzardsprings and similar soils—2.5 percent

Rubylee and similar soils—1 percent

### Soil Properties and Qualities

#### Dalelake soils

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Position on landform:* Sand sheets

*Parent material:* Eolian deposits from mixed sources

*Texture of the surface layer:* Fine sand

*Slope:* 2 to 30 percent

*Typical vegetation:* Creosote bush, big galleta, and cryptantha

#### Pintobasin soils

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Position on landform:* Fan aprons

*Parent material:* Alluvium from granitoid

*Texture of the surface layer:* Sand or fine sand

*Slope:* 0 to 8 percent

*Typical vegetation:* Creosote bush, big galleta, and burrobush

### Minor Components

- Buzzardsprings and Rubylee soils on fan remnants
- Rock outcrop on exposed pediments

### Use and Management

**Major uses:** Recreation and wildlife habitat

#### Recreation

*Management concerns:*

- Because of excessive amounts of sand and minimal vegetation, dustiness is a concern when wind velocity is high.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting traffic to previously established trails.

#### Wildlife habitat

*Management concerns:*

- These soils are poorly suited to habitat for desert tortoises and other burrowing animals due to low soil strength caused by excessive amounts of sand throughout.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

### 3. Pintobasin-Carrizo

*Very deep, sandy and sandy-skeletal soils that formed in recent alluvium from granitoid and/or gneiss; on broad, hyperthermic fan aprons throughout the middle and eastern parts of the park*

#### Setting

*Landform:* Fan aprons and drainageways

*Slope:* 1 to 8 percent

*Elevation:* 655 to 2,890 feet

*Annual air temperature:* 68 to 73 degrees F

*Average annual frost-free days:* 300 to 340 days

#### Composition

*Extent of the map unit within the survey area:* 17 percent

*Extent of the major components within the map unit:*

Pintobasin and similar soils—63 percent

Carrizo and similar soils—30 percent

*Extent of the minor components within the map unit:*

Dalelake and similar soils—4 percent

Rubylee and similar soils—3 percent

#### Soil Properties and Qualities

##### Pintobasin soils

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Position on landform:* Fan aprons

*Parent material:* Recent alluvium from granitoid and/or gneiss

*Texture of the surface layer:* Sand, fine sand, loamy sand, or loamy fine sand

*Slope:* 1 to 8 percent

*Typical vegetation:* Creosote bush

##### Carrizo soils

*Depth class:* Very deep

*Drainage class:* Excessively drained

*Position on landform:* Inset fans and drainageways, including channels and bars

*Parent material:* Recent alluvium from granitoid and/or gneiss

*Texture of the surface layer:* Loamy sand, sandy loam, or fine sandy loam

*Slope:* 2 to 8 percent

*Typical vegetation:* Creosote bush and burrobush

#### Minor Components

- Dalelake soils on sand sheets
- Rubylee soils on fan remnants

#### Use and Management

**Major uses:** Recreation and wildlife habitat

##### Recreation

*Management concerns:*

- Because of excessive amounts of sand and minimal vegetation, dustiness is a concern when wind velocity is high.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting traffic to previously established trails.

**Wildlife habitat**

*Management concerns:*

- These soils are poorly suited to habitat for desert tortoises and other burrowing animals due to low soil strength caused by excessive amounts of sand and gravel throughout.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

## **4. Perurose-Carrizo-Oldale**

*Moderately deep to very deep soils that formed in alluvium, including stable alluvium from granitoid and/or igneous rocks and active alluvium mainly from granitoid rocks; on stable hyperthermic fan remnants with root-restrictive layers and related, active inset fans and drainageways along the eastern edge of the park, especially in Pinto Basin*

### **Setting**

*Landform:* Fan remnants and inset fans

*Slope:* 0 to 15 percent

*Elevation:* 950 to 3,050 feet

*Annual air temperature:* 68 to 73 degrees F

*Average annual frost-free days:* 300 to 340 days

### **Composition**

*Extent of the map unit within the survey area:* 5 percent

*Extent of the major components within the map unit:*

Perurose and similar soils—44 percent

Carrizo and similar soils—23 percent

Oldale and similar soils—15 percent

*Extent of the minor components within the map unit:*

Pintobasin and similar soils—11 percent

Aquapeak and similar soils—5 percent

Rubylee and similar soils—2 percent

### **Soil Properties and Qualities**

#### **Perurose soils**

*Depth class:* Moderately deep

*Drainage class:* Somewhat excessively drained

*Position on landform:* Fan remnants

*Parent material:* Alluvium from granitoid and/or gneiss

*Texture of the surface layer:* Gravel, sand, or loamy fine sand

*Slope:* 2 to 15 percent

*Typical vegetation:* Creosote bush

#### **Carrizo soils**

*Depth class:* Very deep

*Drainage class:* Excessively drained

*Position on landform:* Inset fans and drainageways, including channels and bars

*Parent material:* Recent alluvium from granitoid and/or gneiss

*Texture of the surface layer:* Loamy sand, sandy loam, or fine sandy loam

*Slope:* 2 to 8 percent

*Typical vegetation:* Creosote bush and burrobush

**Oldale soils**

*Depth class:* Very deep

*Drainage class:* Well drained

*Position on landform:* Fan remnants

*Parent material:* Eolian deposits over alluvium from granitoid and/or gneiss

*Texture of the surface layer:* Gravel or silt loam

*Slope:* 0 to 8 percent

*Typical vegetation:* Sparse creosote bush

**Minor Components**

- Pintobasin soils on fan aprons
- Aquapeak and Rubylee soils on fan remnants

**Use and Management**

**Major uses:** Recreation and wildlife habitat

**Recreation**

*Management concerns:*

- Because of excessive amounts of sand and minimal vegetation, dustiness is a concern when wind velocity is high on the sandy soils.
- On stable fan remnants with desert pavement, destruction of the protective surface rock cover can increase erosion, cause excessive dust, and release high levels of nitrates into the environment.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting traffic to previously established trails.

**Wildlife habitat**

*Management concerns:*

- These soils are poorly suited to habitat for desert tortoises and other burrowing animals because of low soil strength due to excessive amounts of sand or gravel or fine textured horizons immediately below surface rock layers.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

## **5. Morongo-Cajon**

*Very deep, sandy soils that formed in recent alluvium from granitoid; on broad, thermic fan aprons*

**Setting**

*Landform:* Fan aprons

*Slope:* 2 to 15 percent

*Elevation:* 1,970 to 3,805 feet

*Annual air temperature:* 55 to 68 degrees F

*Average annual frost-free days:* 270 to 320 days

**Composition**

*Extent of the map unit within the survey area:* 7 percent

*Extent of the major components within the map unit:*

Morongo and similar soils—50 percent

Cajon and similar soils—25 percent

*Extent of the minor components within the map unit:*

Jumborox and similar soils—13 percent



Arizo and similar soils—5.5 percent  
Gocougs and similar soils—4 percent  
Bluecut and similar soils—2.5 percent

### **Soil Properties and Qualities**

#### **Morongo soils**

*Depth class:* Very deep  
*Drainage class:* Somewhat excessively drained  
*Position on landform:* Fan aprons  
*Parent material:* Recent alluvium from granitoid and/or gneiss  
*Texture of the surface layer:* Sand or loamy sand  
*Slope:* 2 to 15 percent  
*Typical vegetation:* Creosote bush, blackbrush, California juniper, and big galleta

#### **Cajon soils**

*Depth class:* Very deep  
*Drainage class:* Somewhat excessively drained  
*Position on landform:* Inset fans and drainageways, including channels and bars  
*Parent material:* Recent alluvium from granitoid and/or gneiss  
*Texture of the surface layer:* Loamy sand, sandy loam, or fine sandy loam  
*Slope:* 1 to 8 percent  
*Typical vegetation:* Creosote bush and burrobush

### **Minor Components**

- Jumborox soils on fan remnants
- Gocougs and Bluecut soils on fan remnants and fan aprons over fan remnants
- Arizo soils in drainageways

### **Use and Management**

**Major uses:** Recreation and wildlife habitat

#### **Recreation**

*Management concerns:*

- Because of excessive amounts of sand and minimal vegetation, dustiness is a concern when wind velocity is high.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting traffic to previously established trails.

#### **Wildlife habitat**

*Management concerns:*

- These soils are poorly suited to habitat for desert tortoises and other burrowing animals due to low soil strength caused by excessive amounts of sand throughout.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

## **6. Pinecity-Rock outcrop-Desertqueen**

*Very shallow and shallow soils intermixed with large areas of rock outcrop; from granitoid or gneissic alluvium over granite rock or from granite residuum; on pediments in the northwestern portion of the park*

### **Setting**

*Landform:* Pediments  
*Slope:* 2 to 30 percent

## Soil Survey of Joshua Tree National Park, California

*Elevation:* 3,610 to 5,180 feet

*Annual air temperature:* 55 to 63 degrees F

*Average annual frost-free days:* 210 to 270 days

### Composition

*Extent of the map unit within the survey area:* 4 percent

*Extent of the major components within the map unit:*

Pinecity and similar soils—50 percent

Rock outcrop—18 percent

Desertqueen and similar soils—15 percent

*Extent of the minor components within the map unit:*

Jumborox and similar soils—10 percent

Morongo and similar soils—7 percent

### Soil Properties and Qualities

#### Pinecity soils

*Depth class:* Very shallow or shallow

*Drainage class:* Somewhat excessively drained

*Position on landform:* Fan aprons over pediments

*Parent material:* Alluvium from granitoid and/or granite over granitoid or granite residuum

*Texture of the surface layer:* Sand or loamy sand

*Slope:* 2 to 15 percent

*Typical vegetation:* Blackbrush, California juniper, and creosote bush

#### Rock outcrop

*Position on landform:* Areas throughout the survey area with pediment surfaces and components

#### Desertqueen soils

*Depth class:* Shallow

*Drainage class:* Well drained

*Position on landform:* Summit on pediments and hills

*Parent material:* Colluvium and/or residuum from granite and/or gneiss

*Texture of the surface layer:* Sandy loam

*Slope:* 2 to 30 percent

*Typical vegetation:* Blackbrush, creosote bush, and Mojave yucca

### Minor Components

- Morongo soils on fan aprons
- Jumborox soils on fan remnants

### Use and Management

**Major uses:** Recreation and wildlife habitat

#### Recreation

*Management concerns:*

- Because of the very shallow and shallow depths to bedrock, there is an increased hazard of erosion, especially on slopes steeper than 20 percent, when the soils are disturbed.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting foot traffic to previously established trails.

**Wildlife habitat**

*Management concerns:*

- These soils are unsuited to habitat for desert tortoises and other burrowing animals because of the shallow depth to bedrock.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

## **7. Bluecut-Morongu-Yuccabutte**

*Very deep soils that formed in varying ages of alluvium from granitoid and gneiss; on stable fan remnants adjacent to more active younger fan aprons found mainly in the middle part of the park, including Pleasant Valley and Cottonwood Basin*

### **Setting**

*Landform:* Stable fan remnants and adjacent fan aprons

*Slope:* 2 to 50 percent

*Elevation:* 2,360 to 4,300 feet

*Annual air temperature:* 55 to 68 degrees F

*Average annual frost-free days:* 210 to 320 days

### **Composition**

*Extent of the map unit within the survey area:* 4 percent

*Extent of the major components within the map unit:*

Bluecut and similar soils—30 percent

Morongu and similar soils—25 percent

Yuccabutte and similar soils—25 percent

*Extent of the minor components within the map unit:*

Helendale and similar soils—7 percent

Arizo and similar soils—5 percent

Minhoyt and similar soils—5 percent

Littlefargo and similar soils—3 percent

### **Soil Properties and Qualities**

#### **Bluecut soils**

*Depth class:* Very deep

*Drainage class:* Well drained

*Position on landform:* Fan aprons over fan remnants and fan remnants

*Parent material:* Alluvium from granite, granitoid, or gneiss

*Texture of the surface layer:* Loamy sand or sandy loam

*Slope:* 2 to 8 percent

*Typical vegetation:* Blackbrush, creosote bush, and burrobush

#### **Morongu soils**

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Position on landform:* Fan aprons

*Parent material:* Alluvium from granite and gneiss

*Texture of the surface layer:* Sand

*Slope:* 4 to 8 percent

*Typical vegetation:* Big galleta, creosote bush, and burrobush

#### **Yuccabutte soils**

*Depth class:* Very deep

*Drainage class:* Well drained

*Position on landform:* Fan remnants

*Parent material:* Alluvium from granitoid and/or and gneiss

*Texture of the surface layer:* Loam

*Slope:* 4 to 50 percent

*Typical vegetation:* Creosote bush, burrobush, and Mojave yucca

#### **Minor Components**

- Helendale and Minhoyt soils on fan remnants
- Arizo soils on inset fans
- Littlefargo soils on hills and pediments

#### **Use and Management**

**Major uses:** Recreation and wildlife habitat

##### **Recreation**

*Management concerns:*

- There is a hazard of erosion on slopes steeper than 20 percent, especially when the soils are disturbed.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting foot traffic to previously established trails.

##### **Wildlife habitat**

*Management concerns:*

- These soils are unsuited to habitat for desert tortoises and other burrowing animals because of the high clay content and/or high content of rock fragments near the soil surface or excessive amounts of sand on the more active fan aprons.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

## **Soils on Hills and Mountains**

### **8. Blackeagle-Rock outcrop**

*Shallow to hard granitoid or gneissic bedrock among large areas of rock outcrop; on hyperthermic hills and mountains throughout the park, such as the lower elevations of the Hexie Mountains, the Pinto Mountains, and the Cottonwood Mountains*

#### **Setting**

*Landform:* Mountains

*Slope:* 15 to 75 percent

*Elevation:* 1,395 to 3,985 feet

*Annual air temperature:* 68 to 73 degrees F

*Average annual frost-free days:* 300 to 340 days

#### **Composition**

*Extent of the map unit within the survey area:* 36 percent

*Extent of the major components within the map unit:*

Blackeagle and similar soils—35 percent

Rock outcrop—35 percent

*Extent of the minor components within the map unit:*

Jadestorm and similar soils—11 percent

Goldenhills and similar soils—7 percent

Whiterobe and similar soils—5 percent  
Seanna and similar soils—3 percent  
Marbolite and similar soils—2 percent  
Carrizo and similar soils—2 percent

### **Soil Properties and Qualities**

#### **Blackeagle soils**

*Depth class:* Shallow

*Drainage class:* Well drained

*Position on landform:* Backslopes of mountains

*Parent material:* Colluvium over residuum from granitoid or gneiss

*Texture of the surface layer:* Gravel or stones

*Slope:* 15 to 75 percent

*Typical vegetation:* Creosote bush and brittlebush

#### **Rock outcrop**

*Position on landform:* All possible areas with components of hills and mountains

### **Minor Components**

- Jadestorm, Goldenhills, Whiterobe, and Marbolite soils on backslopes on hills and mountains
- Seanna soils on cool, north-facing backslopes of mountains
- Carrizo soils in drainageways

### **Use and Management**

**Major uses:** Recreation and wildlife habitat

#### **Recreation**

*Management concerns:*

- There is a hazard of erosion on slopes steeper than 20 percent, especially when the soils are disturbed.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting foot traffic to previously established trails.

#### **Wildlife habitat**

*Management concerns:*

- These soils are unsuited to habitat for desert tortoises and other burrowing animals because of the shallow depth to bedrock.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

## **9. Desertqueen-Pinecity-Rock outcrop**

*Shallow, loamy and sandy soils that formed from granitoid and/or gneissic colluvium over residuum; on thermic mountains, hills, and associated pediments with typic-aridic soil moisture regimes in the middle and northwest portions of the park*

### **Setting**

*Landform:* Hills, pediments, and mountains

*Slope:* 4 to 50 percent

*Elevation:* 2,755 to 5,165 feet

*Annual air temperature:* 55 to 68 degrees F

*Average annual frost-free days:* 210 to 320 days



### Composition

*Extent of the map unit within the survey area:* 18 percent

*Extent of the major components within the map unit:*

Desertqueen and similar soils—30 percent

Pinecity and similar soils—30 percent

Rock outcrop—25 percent

*Extent of the minor components within the map unit:*

Aguilareal and similar soils—9 percent

Helendale and similar soils—3 percent

Blackeagle and similar soils—2 percent

Cajon and similar soils—1 percent

### Soil Properties and Qualities

#### Desertqueen soils

*Depth class:* Shallow

*Drainage class:* Well drained

*Position on landform:* Hills and mountains

*Parent material:* Colluvium and/or residuum from granite and/or granitoid

*Texture of the surface layer:* Sandy loam

*Slope:* 15 to 50 percent

*Typical vegetation:* Blackbrush, Parish's goldeneye, burrobush, and white ratany

#### Pinecity soils

*Depth class:* Very shallow or shallow

*Drainage class:* Somewhat excessively drained

*Position on landform:* Hills, pediments, and mountains

*Parent material:* Colluvium and/or residuum from granite and/or granitoid

*Texture of the surface layer:* Sand or loamy sand

*Slope:* 15 to 60 percent

*Typical vegetation:* Blackbrush, Parish's goldeneye, and narrowleaf goldenbush

#### Rock outcrop

*Position on landform:* All possible areas with components of hills and mountains

### Minor Components

- Aguilareal and Blackeagle soils on backslopes of hills and mountains
- Helendale soils on fan remnants
- Cajon soils on fan aprons

### Use and Management

**Major uses:** Recreation and wildlife habitat

#### Recreation

*Management concerns:*

- There is a hazard of erosion on slopes steeper than 20 percent, especially when the soils are disturbed.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting foot traffic to previously established trails.

#### Wildlife habitat

*Management concerns:*

- These soils are unsuited to habitat for desert tortoises and other burrowing animals because of the shallow depth to bedrock.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

## **10. Smithcanyon-Xeric Torriorthents-Pinecity-Rock outcrop**

*Dominantly very shallow and shallow, sandy soils that formed in colluvium and residuum from granitoid and/or gneissic bedrock; on thermic mountains at the highest elevations and along the most western edge of the park in areas that have the highest amounts of rainfall and an aridic bordering on xeric moisture regime, such as in the upper Little San Bernardino*

### **Setting**

*Landform:* Mountains

*Slope:* 15 to 75 percent

*Elevation:* 3,605 to 5,770 feet

*Annual air temperature:* 55 to 68 degrees F

*Average annual frost-free days:* 210 to 270 days

### **Composition**

*Extent of the map unit within the survey area:* 6 percent

*Extent of the major components within the map unit:*

Smithcanyon and similar soils—35 percent

Xeric Torriorthents and similar soils—20 percent

Pinecity and similar soils—15 percent

Rock outcrop—15 percent

*Extent of the minor components within the map unit:*

Bigbernie and similar soils—9 percent

Goldenhills and similar soils—3 percent

Stubbespring and similar soils—2 percent

### **Soil Properties and Qualities**

#### **Smithcanyon soils**

*Depth class:* Very shallow or shallow

*Drainage class:* Somewhat excessively drained

*Position on landform:* Hills and mountains

*Parent material:* Colluvium and/or residuum from granitoid and/or gneiss

*Texture of the surface layer:* Sand or loamy sand

*Slope:* 15 to 75 percent

*Typical vegetation:* Singleleaf pinyon, bigberry manzanita, Muller's oak, and blackbrush

#### **Xeric Torriorthents**

*Depth class:* Moderately deep to very deep

*Drainage class:* Somewhat excessively drained

*Position on landform:* Hills and mountains

*Parent material:* Colluvium and residuum from granitoid

*Texture of the surface layer:* Loamy sand

*Slope:* 30 to 75 percent

*Typical vegetation:* Singleleaf pinyon, Muller's oak, California juniper, and blackbrush

**Pinecity soils**

*Depth class:* Very shallow or shallow

*Drainage class:* Somewhat excessively drained

*Position on landform:* Hills

*Parent material:* Colluvium and/or residuum from granitoid and/or gneiss

*Texture of the surface layer:* Sand or loamy sand

*Slope:* 15 to 50 percent

*Typical vegetation:* Blackbrush and narrowleaf goldenbush

**Rock outcrop**

*Position on landform:* All possible areas with components of hills and mountains

**Minor Components**

- Bigbernie and Goldenhills soils on the warmer, drier backslopes at low elevations on mountains
- Stubblespring soils on backslopes of hills

**Use and Management**

**Major uses:** Recreation and wildlife habitat

**Recreation**

*Management concerns:*

- There is a hazard of erosion on slopes steeper than 20 percent, especially when the soils are disturbed.

*Management measures:*

- Vegetation and soil surfaces can be protected against damage or destruction by limiting foot traffic to previously established trails.

**Wildlife habitat**

*Management concerns:*

- These soils are unsuited to habitat for desert tortoises and other burrowing animals because of the shallow depth to bedrock.

*Management measures:*

- Included minor soils and ecological sites that can provide suitable habitat should be protected.

# Detailed Soil Map Units

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The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. The soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name

of a soil phase commonly indicates a feature that affects use or management. For example, Morongo loamy sand, 2 to 4 percent slopes, is a phase of the Morongo series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or associations.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Meccapass-Seanna-Contactmine complex, 15 to 75 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Pintobasin-Aquapeak association, 2 to 4 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Table 2 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

## **1220—Jadestorm-Blackeagle-Rock outcrop complex, 15 to 50 percent slopes**

### **Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,850 to 3,985 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Jadestorm and similar soils: 60 percent

Blackeagle and similar soils: 20 percent

Rock outcrop: 10 percent

Dissimilar minor components: 10 percent

### **Description of Jadestorm Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic, shallow Typic  
Torriorthents

#### **Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northwest

*Aspect range:* All aspects

## Soil Survey of Joshua Tree National Park, California

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

### Properties and Qualities

*Depth to restrictive feature:* 4 to 14 inches to paralithic bedrock; 6 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

C—0 to 2 inches; gravel

A—2 to 3 inches; very gravelly loamy sand

Bw—3 to 10 inches; very gravelly sandy loam

Cr—10 to 17 inches; bedrock

R—17 to 26 inches; bedrock

## Description of Blackeagle, Cool Soil

### Classification

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplocambids

### Setting

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss

*Vegetation:* Creosote bush, desert Indianwheat, pincushion flower, curvenut combseed, and sowthistle desertdandelion

### Properties and Qualities

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1



**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.6 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

C—0 to 2 inches; gravel

A—2 to 3 inches; very gravelly loamy sand

AB—3 to 11 inches; extremely gravelly loamy sand

Bw—11 to 18 inches; very gravelly sandy loam

R—18 to 30 inches; bedrock

**Description of Rock Outcrop**

**Setting**

*Landform:* Mountains

*Aspect:* All aspects

*Slope range:* 4 to 100 percent

*Definition:* Areas of exposed gneiss without a soil mantle

**Minor Components**

**Whipple soils**

*Percent of map unit:* 6 percent

*Slope:* 15 to 30 percent

*Landform:* Mountains

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

**Dalelake, thick sandy surface soils**

*Percent of map unit:* 3 percent

*Slope:* 4 to 30 percent

*Landform:* Sand sheets

*Ecological site:* Hyperthermic Sandy Plains (R030XD014CA)

**Carrizo, occasionally flooded, channeled soils**

*Percent of map unit:* 1 percent

*Slope:* 0 to 2 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**1225—Blackeagle-Rock outcrop complex, 15 to 75 percent slopes**

**Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,500 to 4,740 feet

## Soil Survey of Joshua Tree National Park, California

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 63 to 73 degrees F

*Frost-free period:* 270 to 340 days

### Map Unit Composition

Blackeagle and similar soils: 65 percent

Rock outcrop: 15 percent

Dissimilar minor components: 20 percent

### Description of Blackeagle Soil

#### Classification

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplocambids

#### Setting

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* Northwest to southwest (clockwise)

*Slope range:* 15 to 75 percent

*Parent material:* Colluvium over residuum derived from gneiss

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

#### Properties and Qualities

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.6 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### Typical Profile

C—0 to 3 inches; gravel

A—3 to 4 inches; extremely gravelly sandy loam

Bw—4 to 14 inches; very gravelly sandy loam

R—14 to 24 inches; bedrock

### Description of Rock Outcrop

#### Setting

*Landform:* Mountains

*Aspect:* All aspects

*Slope range:* 4 to 100 percent

*Definition:* Areas of exposed gneiss without a soil mantle

#### **Minor Components**

##### **Jadestorm soils**

*Percent of map unit:* 10 percent

*Slope:* 30 to 75 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

##### **Carrizo, occasionally flooded, channeled soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

##### **Whipple, moist soils**

*Percent of map unit:* 5 percent

*Slope:* 15 to 50 percent

*Landform:* North-facing side slopes of mountains

*Ecological site:* Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)

## **1230—Jadestorm-Rock outcrop complex, 30 to 75 percent slopes**

#### **Map Unit Setting**

*Landscape:* Hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,275 to 3,280 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

#### **Map Unit Composition**

Jadestorm and similar soils: 45 percent

Jadestorm, cool and similar soils: 20 percent

Rock outcrop: 15 percent

Dissimilar minor components: 20 percent

#### **Description of Jadestorm Soil**

##### **Classification**

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic, shallow Typic  
Torriorthents

##### **Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* North to west (clockwise)

## Soil Survey of Joshua Tree National Park, California

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

### Properties and Qualities

*Depth to restrictive feature:* 4 to 14 inches to paralithic bedrock; 6 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

C—0 to 3 inches; gravel

A—3 to 7 inches; extremely gravelly sandy loam

Bw—7 to 11 inches; very gravelly sandy loam

Cr—11 to 20 inches; bedrock

R—20 to 30 inches; bedrock

## Description of Jadestorm, Cool Soil

### Classification

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic, shallow Typic Torriorthents

### Setting

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Northeast

*Aspect range:* North to west (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium and/or residuum derived from granitoid rock

*Vegetation:* Creosote bush, smooth desertdandelion, burrobrush, and curvenut combseed

### Properties and Qualities

*Depth to restrictive feature:* 4 to 14 inches to paralithic bedrock; 6 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 0.5 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Dry Hills (R030XD001CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

C—0 to 2 inches; gravel  
A—2 to 3 inches; very gravelly sandy loam  
Bw—3 to 10 inches; very gravelly sandy loam  
Cr—10 to 17 inches; bedrock  
R—17 to 26 inches; bedrock

**Description of Rock Outcrop**

**Setting**

*Landform:* Mountains  
*Aspect:* All aspects  
*Slope range:* 15 to 100 percent  
*Definition:* Areas of exposed granitoid rocks without a soil mantle

**Minor Components**

**Meccapass, dry soils**

*Percent of map unit:* 10 percent  
*Slope:* 15 to 50 percent  
*Landform:* North-facing side slopes of hills  
*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

**Meccapass soils**

*Percent of map unit:* 6 percent  
*Slope:* 15 to 75 percent  
*Landform:* South-facing side slopes of hills  
*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

**Carrizo, occasionally flooded, channeled soils**

*Percent of map unit:* 3 percent  
*Slope:* 4 to 8 percent  
*Landform:* Drainageways  
*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Dalelake soils**

*Percent of map unit:* 1 percent  
*Slope:* 8 to 30 percent  
*Landform:* Sand sheets  
*Ecological site:* Hyperthermic Sandhill (R030XD008CA)

## **1240—Meccapass-Bulletproof-Rock outcrop complex, 30 to 75 percent slopes**

### **Map Unit Setting**

*Landscape:* Mountains  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,410 to 3,770 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 63 to 73 degrees F  
*Frost-free period:* 280 to 340 days

### **Map Unit Composition**

Meccapass and similar soils: 45 percent  
Bulletproof and similar soils: 20 percent  
Rock outcrop: 10 percent  
Dissimilar minor components: 25 percent

### **Description of Meccapass Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocambids

#### **Setting**

*Landform:* Mountains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Lower third of mountain flank  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* Southeast  
*Aspect range:* East to west (clockwise)  
*Slope range:* 30 to 75 percent  
*Parent material:* Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss  
*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

#### **Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock  
*Shrink-swell potential:* Low (about 0.8 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.7 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A



### Typical Profile

C—0 to 1 inch; gravel  
A—1 to 2 inches; gravelly loamy fine sand  
Bk—2 to 16 inches; very gravelly loam  
BCK—16 to 37 inches; extremely gravelly sandy loam  
Cr—37 to 59 inches; bedrock

### Description of Bulletproof Soil

#### Classification

Sandy, mixed, hyperthermic, shallow Typic Torriorthents

#### Setting

*Landform:* Mountains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Mountain flank  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* Southwest  
*Aspect range:* East to west (clockwise)  
*Slope range:* 30 to 75 percent  
*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid  
*Vegetation:* Burrobush, Parish's goldeneye, annual forbs, bastardsage, brittlebush, and curvenut combseed

#### Properties and Qualities

*Depth to restrictive feature:* 10 to 14 inches to paralithic bedrock  
*Shrink-swell potential:* Low (about 0.4 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 0.5 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

### Typical Profile

C—0 to 3 inches; gravel  
A—3 to 6 inches; gravelly loamy sand  
Btk—6 to 11 inches; very paragravelly loamy coarse sand  
Cr—11 to 59 inches; bedrock

### Description of Rock Outcrop

#### Setting

*Landform:* Mountains  
*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

#### **Minor Components**

##### **Meccapass soils**

*Percent of map unit:* 10 percent

*Slope:* 8 to 30 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

##### **Jadestorm, moist soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 15 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

##### **Seanna soils**

*Percent of map unit:* 5 percent

*Slope:* 30 to 75 percent

*Landform:* North-facing, high-elevation side slopes of mountains

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

##### **Fanhill, moist soils**

*Percent of map unit:* 2 percent

*Slope:* 30 to 75 percent

*Landform:* North-facing side slopes of mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

##### **Marbolite, cool soils**

*Percent of map unit:* 2 percent

*Slope:* 30 to 75 percent

*Landform:* Mountains and hills

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

##### **Carrizo, occasionally flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 15 percent

*Landform:* Drainageways

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

## **1241—Meccapass-Seanna-Contactmine complex, 15 to 75 percent slopes**

#### **Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,965 to 4,330 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 63 to 73 degrees F

*Frost-free period:* 270 to 340 days

#### **Map Unit Composition**

Meccapass and similar soils: 45 percent

Seanna and similar soils: 20 percent

Contact mine and similar soils: 20 percent

Dissimilar minor components: 15 percent

### Description of Meccapass Soil

#### Classification

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocambids

#### Setting

*Landform*: South-facing side slopes of mountains

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Mountain flank

*Down-slope shape*: Concave

*Across-slope shape*: Concave

*Aspect (representative)*: South

*Aspect range*: East to southwest (clockwise)

*Slope range*: 15 to 75 percent

*Parent material*: Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss

*Vegetation*: Brittlebush, creosote bush, pincushion flower, and California fagonbush

#### Properties and Qualities

*Depth to restrictive feature*: 20 to 39 inches to paralithic bedrock

*Shrink-swell potential*: Low (about 0.8 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Well drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Very low (about 1.4 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7e

*Ecological site*: Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status*: No

*Hydrologic soil group*: A

#### Typical Profile

C—0 to 1 inch; gravel

A—1 to 2 inches; gravelly sandy loam

Bk—2 to 16 inches; very gravelly loam

BCK—16 to 27 inches; extremely gravelly sandy loam

Cr—27 to 59 inches; bedrock

### Description of Seanna Soil

#### Classification

Loamy, mixed, superactive, calcareous, thermic, shallow Typic Torriorthents

#### Setting

*Landform*: North-facing side slopes of mountains

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Mountain flank and center third of mountain flank

## Soil Survey of Joshua Tree National Park, California

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* West to north (clockwise)

*Slope range:* 15 to 75 percent

*Parent material:* Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss

*Vegetation:* Burrobush, creosote bush, redstem stork's bill, white ratany, and Mojave yucca

### Properties and Qualities

*Depth to restrictive feature:* 4 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

A—0 to 1 inch; gravelly sandy loam

Bk—1 to 12 inches; gravelly sandy loam

Crk—12 to 59 inches; bedrock

## Description of Contactmine, Dry Soil

### Classification

Fine-loamy, mixed, superactive, thermic Typic Haplargids

### Setting

*Landform:* North-facing side slopes of mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Northeast

*Aspect range:* North to northeast (clockwise)

*Slope range:* 15 to 75 percent

*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss

*Vegetation:* Burrobush, creosote bush, redstem stork's bill, white ratany, and Mojave yucca

### Properties and Qualities

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 2.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

**Typical Profile**

A—0 to 2 inches; gravelly sandy loam

Bw—2 to 6 inches; sandy loam

Bt—6 to 11 inches; gravelly sandy clay loam

Btk—11 to 25 inches; cobbly loam

Crt—25 to 59 inches; bedrock

**Minor Components**

**Rock outcrop**

*Percent of map unit:* 8 percent

*Slope:* 8 to 100 percent

**Cajon, rarely flooded soils**

*Percent of map unit:* 4 percent

*Slope:* 2 to 4 percent

*Landform:* Narrow drainageways

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

**Whiterobe soils**

*Percent of map unit:* 2 percent

*Slope:* 50 to 75 percent

*Landform:* Steep, upper side slopes of mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

**Ironped, moist soils**

*Percent of map unit:* 1 percent

*Slope:* 30 to 50 percent

*Landform:* Low-elevation side slopes of mountains

*Ecological site:* Limy Hill 3-5" P.Z. (R030XB139CA)

**1242—Meccapass-Jadestorm-Rock outcrop complex, 15 to 75 percent slopes**

**Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,440 to 4,590 feet

*Mean annual precipitation:* 3 to 7 inches

## Soil Survey of Joshua Tree National Park, California

*Mean annual air temperature:* 63 to 73 degrees F

*Frost-free period:* 270 to 340 days

### Map Unit Composition

Meccapass and similar soils: 40 percent

Jadestorm and similar soils: 25 percent

Rock outcrop: 15 percent

Dissimilar minor components: 20 percent

### Description of Meccapass Soil

#### Classification

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocambids

#### Setting

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southwest

*Aspect range:* Northeast to southwest (clockwise)

*Slope range:* 15 to 75 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

#### Properties and Qualities

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.4 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### Typical Profile

C—0 to 1 inch; gravel

A—1 to 2 inches; very gravelly sandy loam

Bk—2 to 16 inches; very gravelly loam

BCK—16 to 27 inches; extremely gravelly sandy loam

Cr—27 to 59 inches; bedrock



### Description of Jadestorm Soil

#### Classification

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic, shallow Typic Torriorthents

#### Setting

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* Southwest

*Aspect range:* Northeast to southwest (clockwise)

*Slope range:* 15 to 75 percent

*Parent material:* Colluvium derived from granitoid and/or residuum weathered from granitoid

*Vegetation:* Brittlebush and creosote bush

#### Properties and Qualities

*Depth to restrictive feature:* 4 to 14 inches to paralithic bedrock; 6 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### Typical Profile

C—0 to 2 inches; gravel

A—2 to 3 inches; gravelly sandy loam

Bk—3 to 8 inches; very gravelly sandy loam

Cr—8 to 20 inches; bedrock

R—20 to 30 inches; bedrock

### Description of Rock Outcrop

#### Setting

*Landform:* Mountains

*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

### Minor Components

#### **Contactmine, hot soils**

*Percent of map unit:* 9 percent

*Slope:* 15 to 60 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

#### **Meccapass, cool soils**

*Percent of map unit:* 5 percent

*Slope:* 15 to 75 percent

*Landform:* North-facing mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

#### **Bulletproof soils**

*Percent of map unit:* 2 percent

*Slope:* 15 to 75 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

#### **Jadestorm, moist soils**

*Percent of map unit:* 2 percent

*Slope:* 15 to 75 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

#### **Carrizo, occasionally flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 15 percent

*Landform:* Drainageways

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

#### **Fanhill, moist soils**

*Percent of map unit:* 1 percent

*Slope:* 15 to 75 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

## **1250—Ironlung-Rock outcrop complex, 30 to 75 percent slopes**

### Map Unit Setting

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,145 to 3,440 feet

*Mean annual precipitation:* 2 to 7 inches

*Mean annual air temperature:* 63 to 77 degrees F

*Frost-free period:* 270 to 360 days

### Map Unit Composition

Ironlung and similar soils: 50 percent

Ironlung, cool and similar soils: 20 percent

Rock outcrop: 15 percent

Dissimilar minor components: 15 percent

### Description of Ironlung Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic, shallow Typic Torriorthents

#### Setting

*Landform*: South-facing side slopes of mountains

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Mountain flank

*Down-slope shape*: Linear

*Across-slope shape*: Convex

*Aspect (representative)*: Southwest

*Aspect range*: Northeast to west (clockwise)

*Slope range*: 30 to 75 percent

*Parent material*: Colluvium derived from gneiss, colluvium derived from granitoid, residuum weathered from granitoid, and/or residuum weathered from gneiss

*Vegetation*: Brittlebush, creosote bush, and burrobrush

#### Properties and Qualities

*Depth to restrictive feature*: 4 to 14 inches to paralithic bedrock

*Shrink-swell potential*: Low (about 0.1 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Somewhat excessively drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Very low (about 0.2 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 8

*Ecological site*: Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status*: No

*Hydrologic soil group*: D

#### Typical Profile

A—0 to 2 inches; very gravelly sand

C—2 to 6 inches; very gravelly coarse sand

Cr—6 to 59 inches; bedrock

### Description of Ironlung, Cool Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic, shallow Typic Torriorthents

#### Setting

*Landform*: North-facing side slopes of mountains

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Mountain flank

*Down-slope shape*: Linear

*Across-slope shape*: Linear

*Aspect (representative)*: North

*Aspect range*: West to northeast (clockwise)

*Slope range*: 30 to 75 percent

## Soil Survey of Joshua Tree National Park, California

*Parent material:* Colluvium derived from gneiss, colluvium derived from granitoid, residuum weathered from granitoid, and/or residuum weathered from gneiss

*Vegetation:* Parish's goldeneye, burrobush, brittlebush, Mojave woodyaster, and white ratany

### Properties and Qualities

*Depth to restrictive feature:* 4 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.2 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

A—0 to 1 inch; very gravelly sand

C—1 to 4 inches; very gravelly coarse sand

Cr—4 to 59 inches; bedrock

## Description of Rock Outcrop

### Setting

*Landform:* Mountains

*Aspect:* All aspects

*Slope range:* 4 to 100 percent

*Definition:* Areas of exposed granitoid rocks and/or gneiss without a soil mantle

### Minor Components

#### Ironlung, rubbly, cool soils

*Percent of map unit:* 3 percent

*Slope:* 30 to 75 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

#### Ironped, cool soils

*Percent of map unit:* 3 percent

*Slope:* 30 to 75 percent

*Landform:* Mountains

*Ecological site:* Moderately Deep Gravelly Mountain Slopes (R030XB213CA)

#### Whiterobe soils

*Percent of map unit:* 3 percent

*Slope:* 30 to 75 percent

*Landform:* South-facing side slopes of mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

**Carrizo, occasionally flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 15 percent

*Landform:* Channels

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

**Whiterobe, cool soils**

*Percent of map unit:* 2 percent

*Slope:* 30 to 75 percent

*Landform:* North-facing side slopes of mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

**Bolero, moist soils**

*Percent of map unit:* 1 percent

*Slope:* 8 to 30 percent

*Landform:* Ridges

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

**Pintobasin, steep, moist soils**

*Percent of map unit:* 1 percent

*Slope:* 15 to 50 percent

*Landform:* Fan remnants

*Ecological site:* Coarse Gravelly Fans (R030XD039CA)

**1255—Goldenhills-Bulletproof-Fanhill-Whiterobe complex, 30 to 75 percent slopes**

**Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 390 to 4,590 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 63 to 73 degrees F

*Frost-free period:* 270 to 360 days

**Map Unit Composition**

Goldenhills and similar soils: 40 percent

Bulletproof and similar soils: 15 percent

Fanhill and similar soils: 15 percent

Whiterobe and similar soils: 15 percent

Dissimilar minor components: 15 percent

**Description of Goldenhills Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* South-facing side slopes of mountains, at elevations below 1,000 meters

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* Northeast to west (clockwise)

*Slope range:* 30 to 75 percent

## Soil Survey of Joshua Tree National Park, California

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

### Properties and Qualities

*Depth to restrictive feature:* 39 to 59 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.8 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

C—0 to 2 inches; gravel

A—2 to 3 inches; very gravelly loamy sand

Bw—3 to 10 inches; very gravelly loamy sand

Ck1—10 to 26 inches; gravelly loamy sand

Ck2—26 to 47 inches; extremely cobbly loamy sand

R—47 to 57 inches; bedrock

## Description of Bulletproof Soil

### Classification

Sandy, mixed, hyperthermic, shallow Typic Torriorthents

### Setting

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Burrobush, Parish's goldeneye, annual forbs, bastardsage, brittlebush, and curvenut combseed

### Properties and Qualities

*Depth to restrictive feature:* 10 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates



### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.7 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

C—0 to 2 inches; cobbles

A—2 to 3 inches; gravelly loamy sand

Bw—3 to 5 inches; loamy sand

C'—5 to 14 inches; loamy sand

Cr—14 to 59 inches; bedrock

## Description of Fanhill Soil

### Classification

Loamy, mixed, superactive, hyperthermic, shallow Typic Haplocambids

### Setting

*Landform:* North- and west-facing sides of mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southwest

*Aspect range:* Northeast to west (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

### Properties and Qualities

*Depth to restrictive feature:* 14 to 20 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### **Typical Profile**

C—0 to 5 inches; cobbles

A—5 to 6 inches; fine sandy loam

Bk1—6 to 15 inches; gravelly sandy loam

Bk2—15 to 18 inches; gravelly loamy coarse sand

## **Description of Whiterobe Soil**

### **Classification**

Sandy, mixed, hyperthermic Typic Torriorthents

### **Setting**

*Landform:* South-facing side slopes of mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southwest

*Aspect range:* Northeast to west (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

### **Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.3 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### **Typical Profile**

C—0 to 1 inch; gravel

A—1 to 2 inches; very gravelly loamy sand

Bk1—2 to 12 inches; very gravelly loamy sand

Bk2—12 to 26 inches; paragravelly sand

Crk—26 to 59 inches; bedrock

### Minor Components

#### **Rock outcrop**

*Percent of map unit:* 8 percent

*Slope:* 8 to 100 percent

#### **Ironlung, rubbly soils**

*Percent of map unit:* 2 percent

*Slope:* 30 to 75 percent

*Landform:* South-facing side slopes of mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

#### **Ironped, cool soils**

*Percent of map unit:* 2 percent

*Slope:* 30 to 75 percent

*Landform:* Mountains

*Ecological site:* Moderately Deep Gravelly Mountain Slopes (R030XB213CA)

#### **Carrizo, occasionally flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 15 percent

*Landform:* Channels

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

#### **Rubylee, very rarely flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 8 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Coarse Gravelly Fans (R030XD039CA)

## **1260—Whiterobe-Bigbernie complex, 30 to 75 percent slopes**

### Map Unit Setting

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,965 to 4,590 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 63 to 73 degrees F

*Frost-free period:* 270 to 360 days

### Map Unit Composition

Whiterobe and similar soils: 45 percent

Bigbernie and similar soils: 20 percent

Whiterobe, cool and similar soils: 15 percent

Dissimilar minor components: 20 percent

### Description of Whiterobe Soil

#### **Classification**

Sandy, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* South-facing side slopes of mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape*: Linear  
*Aspect (representative)*: South  
*Aspect range*: Northeast to west (clockwise)  
*Slope range*: 30 to 75 percent  
*Parent material*: Colluvium derived from gneiss and/or from granitoid over residuum weathered from granitoid and/or from gneiss  
*Vegetation*: Brittlebush, creosote bush, pincushion flower, and California fagonbush

**Properties and Qualities**

*Depth to restrictive feature*: 20 to 39 inches to paralithic bedrock  
*Shrink-swell potential*: Low (about 0.3 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ )*: High  
*Natural drainage class*: Somewhat excessively drained  
*Flooding frequency*: None  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Very low (about 1.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated)*: 8  
*Ecological site*: Hyperthermic Steep South Slopes (R030XD003CA)  
*Hydric soil status*: No  
*Hydrologic soil group*: A

**Typical Profile**

A—0 to 1 inch; very gravelly loamy sand  
Bk1—1 to 11 inches; very gravelly loamy sand  
Bk2—11 to 24 inches; paragravelly sand  
Crk—24 to 59 inches; bedrock

**Description of Bigbernie Soil**

**Classification**

Sandy-skeletal, mixed, thermic Typic Torriorthents

**Setting**

*Landform*: North-facing side slopes of mountains  
*Landform position (two-dimensional)*: Backslope  
*Landform position (three-dimensional)*: Mountain flank  
*Down-slope shape*: Linear  
*Across-slope shape*: Linear  
*Aspect (representative)*: North  
*Aspect range*: West to northeast (clockwise)  
*Slope range*: 30 to 75 percent  
*Parent material*: Colluvium derived from gneiss and/or from granitoid over residuum weathered from granitoid and/or from gneiss  
*Vegetation*: California juniper, bastardsage, green rabbitbrush, wishbone-bush, blackbrush, and Eastern Mojave buckwheat

**Properties and Qualities**

*Depth to restrictive feature*: 20 to 39 inches to paralithic bedrock  
*Shrink-swell potential*: Low (about 0.2 LEP)  
*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.8 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Moderately Deep Gravelly Mountain Slopes (R030XB213CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly loamy sand

Bw—1 to 4 inches; very gravelly loamy sand

BC—4 to 24 inches; very gravelly sand

Cr—24 to 59 inches; bedrock

**Description of Whiterobe, Cool Soil**

**Classification**

Sandy, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Low-elevation, north-facing side slopes of mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from gneiss and/or from granitoid over residuum weathered from granitoid and/or from gneiss

*Vegetation:* Burrobush, Parish's goldeneye, annual forbs, bastardsage, brittlebush, and curvenut combseed

**Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; very gravelly loamy sand

Bk1—1 to 11 inches; very gravelly loamy sand

Bk2—11 to 24 inches; paragravelly sand

Crk—24 to 59 inches; bedrock

**Minor Components**

**Rock outcrop**

*Percent of map unit:* 10 percent

*Slope:* 8 to 100 percent

**Bigbernie, strongly sloping soils**

*Percent of map unit:* 7 percent

*Slope:* 8 to 30 percent

*Landform:* Ridges

*Ecological site:* Moderately Deep Gravelly Mountain Slopes (R030XB213CA)

**Carrizo, occasionally flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 8 to 15 percent

*Landform:* Drainageways

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

**1410—Missionwell-Rock outcrop complex, 15 to 50 percent slopes**

**Map Unit Setting**

*Landscape:* Basalt hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 980 to 2,195 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Missionwell and similar soils: 50 percent

Rock outcrop: 20 percent

Missionwell, high elevation and similar soils: 15 percent

Dissimilar minor components: 15 percent

**Description of Missionwell Soil**

**Classification**

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Torriorthents

**Setting**

*Landform:* Basalt hills and basalt lava flows

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear and convex

*Aspect (representative):* South

## Soil Survey of Joshua Tree National Park, California

*Aspect range:* East to southwest (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from basalt over residuum weathered from basalt

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

### Properties and Qualities

*Depth to restrictive feature:* 3 to 14 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.3 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

C—0 to 2 inches; gravel

A—2 to 3 inches; extremely gravelly loamy fine sand

Bk—3 to 8 inches; extremely gravelly sandy loam

R—8 to 18 inches; bedrock

## Description of Rock Outcrop

### Setting

*Landform:* Hills and basalt flows

*Aspect:* All aspects

*Slope range:* 8 to 100 percent

*Definition:* Areas of exposed basalt without a soil mantle

## Description of Missionwell, High Elevation Soil

### Classification

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Torriorthents

### Setting

*Landform:* Basalt lava flows and basalt hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from basalt over residuum weathered from basalt

*Vegetation:* Creosote bush, smooth desertdandelion, and desert Indianwheat

### Properties and Qualities

*Depth to restrictive feature:* 3 to 14 inches to lithic bedrock



*Shrink-swell potential:* Low (about 0.4 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 0.4 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Dry Hills (R030XD001CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

C—0 to 2 inches; gravel  
A—2 to 3 inches; very gravelly fine sandy loam  
Bk—3 to 8 inches; extremely gravelly sandy loam  
R—8 to 18 inches; bedrock

**Minor Components**

**Typic Haplocalcids, volcanic soils**

*Percent of map unit:* 10 percent  
*Slope:* 8 to 30 percent  
*Landform:* Basalt lava flows and basalt hills  
*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

**Missionwell, strongly alkaline soils**

*Percent of map unit:* 3 percent  
*Slope:* 15 to 30 percent  
*Landform:* Basalt lava flows and basalt hills  
*Ecological site:* Hyperthermic Saline Hill (R030XD152CA)

**Dalelake, thick sandy surface soils**

*Percent of map unit:* 2 percent  
*Slope:* 8 to 30 percent  
*Landform:* Sand sheets on basalt hills  
*Ecological site:* Hyperthermic Sandy Plains (R030XD014CA)

**1415—Bolero-Rock outcrop complex, 30 to 75 percent slopes**

**Map Unit Setting**

*Landscape:* Mountains  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,555 to 3,115 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### Map Unit Composition

Bolero and similar soils: 60 percent  
Rock outcrop: 20 percent  
Dissimilar minor components: 20 percent

### Description of Bolero Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Lithic Torriorthents

#### Setting

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* East

*Aspect range:* Northwest to southwest (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid and/or gneiss over residuum  
weathered from granitoid and/or gneiss

*Vegetation:* Curvenut combseed and creosote bush

#### Properties and Qualities

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.5 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Hyperthermic Dry Hills (R030XD001CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### Typical Profile

C—0 to 6 inches; cobbles

A—6 to 7 inches; very gravelly loamy fine sand

Bw—7 to 12 inches; very gravelly loamy fine sand

Bk—12 to 15 inches; very gravelly loamy fine sand

Ck—15 to 19 inches; gravel

R—19 to 29 inches; bedrock

### Description of Rock Outcrop

#### Setting

*Landform:* Mountains

*Aspect:* All aspects

*Slope range:* 4 to 100 percent

*Definition:* Areas of exposed granitoid rocks and/or gneiss without a soil mantle

#### **Minor Components**

##### **Goldenhills, dry soils**

*Percent of map unit:* 10 percent

*Slope:* 8 to 15 percent

*Landform:* South-facing side slopes of mountains

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

##### **Ironlung soils**

*Percent of map unit:* 5 percent

*Slope:* 30 to 60 percent

*Landform:* South-facing side slopes of mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

##### **Supplymine, dry soils**

*Percent of map unit:* 3 percent

*Slope:* 30 to 60 percent

*Landform:* Lower backslopes of mountains

*Ecological site:* Hyperthermic Dry Hills (R030XD001CA)

##### **Carrizo, occasionally flooded, channeled soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 15 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

## **1504—Rizzo association, 4 to 15 percent slopes, rubbly**

#### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 1,130 to 2,885 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

#### **Map Unit Composition**

Rizzo, rarely flooded, stony and similar soils: 50 percent

Rizzo, occasionally flooded, stony and similar soils: 35 percent

Dissimilar minor components: 15 percent

#### **Description of Rizzo, Rarely Flooded, Stony Soil**

##### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

##### **Setting**

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* South

## Soil Survey of Joshua Tree National Park, California

*Aspect range:* East to southwest (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from granite and gneiss

*Vegetation:* Creosote bush, buckwheat, chia, California fagonbush, and lupine

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.0 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Cobbly Fan Remnants (R031XY201CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 1 inch; loamy fine sand

C1—1 to 9 inches; very gravelly loamy coarse sand

C2—9 to 19 inches; very gravelly loamy coarse sand

Ck—19 to 59 inches; very gravelly coarse sand

## Description of Rizzo, Occasionally Flooded, Stony Soil

### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

### Setting

*Landform:* Inset fans

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from granite and gneiss

*Vegetation:* Blue paloverde and desert lavender

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Stony, Occasionally Flooded Ephemeral Stream (R031XY202CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; gravelly loamy coarse sand

C1—2 to 9 inches; very gravelly loamy coarse sand

C2—9 to 19 inches; very gravelly loamy coarse sand

Ck—19 to 59 inches; very gravelly coarse sand

**Minor Components**

**Rockhound, cobbly soils**

*Percent of map unit:* 8 percent

*Slope:* 4 to 15 percent

*Landform:* Fan remnants

*Ecological site:* Cobbly Fan Remnants (R031XY201CA)

**Rizzo, frequently flooded, rubbly soils**

*Percent of map unit:* 7 percent

*Slope:* 2 to 15 percent

*Landform:* Channels

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

**1510—Carrizo very gravelly sandy loam, 2 to 4 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,145 to 3,245 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Carrizo, very gravelly sandy loam and similar soils: 85 percent

Dissimilar minor components: 15 percent

**Description of Carrizo, Very Gravelly Sandy Loam Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Alluvial fans and fan aprons

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southeast

*Aspect range:* Northeast to south (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush and burrobush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; very gravelly sandy loam

AC—1 to 5 inches; very gravelly loamy sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

**Minor Components**

**Oldale soils**

*Percent of map unit:* 6 percent

*Slope:* 0 to 2 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

**Carrizo, occasionally flooded, channeled soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Pintobasin, overblown soils**

*Percent of map unit:* 4 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

**1511—Carrizo complex, 2 to 8 percent slopes, flooded**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

## Soil Survey of Joshua Tree National Park, California

*Elevation:* 1,735 to 3,280 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### Map Unit Composition

Carrizo, channeled and similar soils: 75 percent  
Carrizo, occasionally flooded and similar soils: 15 percent  
Dissimilar minor components: 10 percent

### Description of Carrizo, Channeled Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform:* Alluvial fans and fan aprons  
*Landform position (two-dimensional):* Shoulder and backslope  
*Landform position (three-dimensional):* Side slope and tread  
*Down-slope shape:* Convex and linear  
*Across-slope shape:* Linear and convex  
*Aspect (representative):* East  
*Aspect range:* North to southeast (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Curvenut combseed, spineflower, creosote bush, and desertsenna

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* Rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Flooded Gravelly Fans (R030XY038CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

#### Typical Profile

A—0 to 1 inch; loamy sand  
C—1 to 5 inches; very gravelly sand  
Ck1—5 to 13 inches; very gravelly sand  
Ck2—13 to 59 inches; extremely gravelly sand

### Description of Carrizo, Occasionally Flooded Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents



**Setting**

*Landform:* Drainageways on alluvial fans and drainageways on fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush and burrobush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream  
(R030XY001CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; very gravelly loamy sand

Bk—1 to 5 inches; very gravelly sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; extremely gravelly sand

**Minor Components**

**Carrizo, occasionally flooded, channeled soils**

*Percent of map unit:* 10 percent

*Slope:* 2 to 8 percent

*Landform:* Drainageways

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

**1512—Carrizo extremely gravelly sandy loam, 2 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,390 to 3,115 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

#### **Map Unit Composition**

Carrizo, extremely gravelly sandy loam and similar soils: 80 percent

Dissimilar minor components: 20 percent

#### **Description of Carrizo, Extremely Gravelly Sandy Loam Soil**

##### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

##### **Setting**

*Landform:* Fan aprons and alluvial fans

*Landform position (two-dimensional):* Shoulder and backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear and convex

*Aspect (representative):* Southeast

*Aspect range:* Northeast to south (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush and burrobush

##### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

##### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.3 inches)

##### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

##### **Typical Profile**

A—0 to 1 inch; extremely gravelly sandy loam

AC—1 to 4 inches; extremely gravelly sand

C—4 to 59 inches; extremely gravelly loamy sand

#### **Minor Components**

##### **Carrizo, rarely flooded soils**

*Percent of map unit:* 10 percent

*Slope:* 8 to 30 percent

*Landform:* Alluvial fans

*Ecological site:* Hyperthermic Fans (R030XD015CA)

**Carrizo, occasionally flooded, channeled soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 8 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Carrizo, channeled soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 8 percent

*Landform:* Inset fans and fan aprons

*Ecological site:* Flooded Gravelly Fans (R030XY038CA)

**Carrizo, occasionally flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 8 percent

*Landform:* Drainageways

*Ecological site:* Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream  
(R030XY001CA)

**Oldale soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

**1513—Carrizo-Rubylee complex, 1 to 4 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,180 to 2,850 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Carrizo and similar soils: 60 percent

Carrizo, occasionally flooded, channeled and similar soils: 20 percent

Rubylee and similar soils: 15 percent

Dissimilar minor components: 5 percent

**Description of Carrizo Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 1 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; fine sandy loam

AC—1 to 5 inches; very gravelly loamy sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

**Description of Carrizo, Occasionally Flooded, Channeled Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Drainageways

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 1 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Catclaw acacia, Asian mustard, bladderpod spiderflower, and burrobrush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; extremely gravelly loamy sand

AC—1 to 5 inches; very gravelly loamy sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

**Description of Rubylee Soil**

**Classification**

Coarse-loamy, mixed, superactive, hyperthermic Typic Haplargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 1 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Pincushion flower, desert Indianwheat, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Desert Pavement (R030XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; fine sandy loam

Bt—2 to 5 inches; gravelly sandy loam

Btkq—5 to 18 inches; gravelly sandy loam

Bkq—18 to 59 inches; gravelly loamy sand

### Minor Components

#### Oldale soils

*Percent of map unit:* 5 percent

*Slope:* 2 to 15 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants

(R030XD042CA)

## 1514—Carrizo-Pintobasin-Rubylee complex, 0 to 4 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,145 to 1,525 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### Map Unit Composition

Carrizo, rarely flooded and similar soils: 40 percent

Pintobasin, fine sandy loam and similar soils: 30 percent

Rubylee and similar soils: 15 percent

Dissimilar minor components: 15 percent

### Description of Carrizo, Rarely Flooded Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 2 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush and burrobush

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Fans (R030XD015CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly loamy sand  
C1—1 to 5 inches; gravelly sand  
C2—5 to 59 inches; very gravelly sand

**Description of Pintobasin, Fine Sandy Loam Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* All aspects  
*Slope range:* 0 to 2 percent  
*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 4.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; fine sandy loam  
AC—2 to 4 inches; gravelly sand  
C1—4 to 24 inches; loamy fine sand  
C2—24 to 59 inches; loamy sand



### Description of Rubylee Soil

#### Classification

Coarse-loamy, mixed, superactive, hyperthermic Typic Haplargids

#### Setting

*Landform*: Fan remnants

*Landform position (two-dimensional)*: Summit

*Landform position (three-dimensional)*: Interfluve

*Down-slope shape*: Linear

*Across-slope shape*: Linear

*Aspect (representative)*: Southeast

*Aspect range*: East to south (clockwise)

*Slope range*: 1 to 4 percent

*Parent material*: Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation*: Pincushion flower, desert Indianwheat, and creosote bush

#### Properties and Qualities

*Depth to restrictive feature*: None within a depth of 60 inches

*Shrink-swell potential*: Low (about 1.2 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: 3

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Well drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Low (about 3.7 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7s

*Ecological site*: Desert Pavement (R030XY002CA)

*Hydric soil status*: No

*Hydrologic soil group*: A

#### Typical Profile

A—0 to 2 inches; fine sandy loam

Bt—2 to 5 inches; gravelly sandy loam

Btkq—5 to 18 inches; gravelly sandy loam

Bkq—18 to 59 inches; gravelly loamy sand

### Minor Components

#### Carrizo, occasionally flooded, channeled soils

*Percent of map unit*: 10 percent

*Slope*: 0 to 4 percent

*Landform*: Channels

*Ecological site*: Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

#### Oldale soils

*Percent of map unit*: 5 percent

*Slope*: 1 to 4 percent

*Landform*: Fan remnants

*Ecological site*: Desert Pavement (R030XY002CA)

## 1515—Pintobasin-Carrizo complex, 2 to 8 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,065 to 2,620 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### Map Unit Composition

Pintobasin and similar soils: 80 percent  
Carrizo, occasionally flooded and similar soils: 15 percent  
Dissimilar minor components: 5 percent

### Description of Pintobasin Soil

#### Classification

Mixed, hyperthermic Typic Torripsamments

#### Setting

*Landform:* Alluvial fans  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* Southwest  
*Aspect range:* Southeast to west (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Creosote bush

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.6 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

#### Typical Profile

A—0 to 2 inches; gravelly loamy fine sand  
AC—2 to 4 inches; gravelly sand

C1—4 to 24 inches; gravelly sand

C2—24 to 59 inches; gravelly sand

### **Description of Carrizo, Occasionally Flooded Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Drainageways

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southwest

*Aspect range:* Southeast to west (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush and burrobush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream  
(R030XY001CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; very gravelly loamy sand

Bk—1 to 5 inches; very gravelly sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; extremely gravelly sand

### **Minor Components**

#### **Carrizo, frequently flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 8 percent

*Landform:* Active channels

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

#### **Duric Petroargids**

*Percent of map unit:* 2 percent

*Slope:* 4 to 8 percent

*Landform:* Fan aprons on fan remnants

*Ecological site:* Hyperthermic Fans (R030XD015CA)

**Rock outcrop**

*Percent of map unit:* 1 percent

*Slope:* 8 to 30 percent

## **1516—Pintobasin fine sandy loam, 0 to 2 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,065 to 1,245 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Pintobasin, fine sandy loam and similar soils: 90 percent

Dissimilar minor components: 10 percent

### **Description of Pintobasin, Fine Sandy Loam Soil**

#### **Classification**

Mixed, hyperthermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 2 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Desert Indianwheat, suncup, and creosote bush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.6 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; fine sandy loam

AC—2 to 4 inches; gravelly sand

C1—4 to 24 inches; loamy fine sand

C2—24 to 59 inches; loamy sand

**Minor Components**

**Pintobasin, rarely flooded soils**

*Percent of map unit:* 7 percent

*Slope:* 0 to 2 percent

*Landform:* Drainageways

*Ecological site:* Hyperthermic Fans (R030XD015CA)

**Dalelake soils**

*Percent of map unit:* 3 percent

*Slope:* 0 to 2 percent

*Landform:* Sand sheets

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

**1517—Pintobasin-Dalelake complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,045 to 2,245 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Pintobasin and similar soils: 65 percent

Dalelake and similar soils: 25 percent

Dissimilar minor components: 10 percent

**Description of Pintobasin Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* Southeast to southwest (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid with eolian influence

*Vegetation:* Creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; fine sand

AC—1 to 4 inches; gravelly sand

C1—4 to 24 inches; gravelly sand

C2—24 to 59 inches; gravelly sand

**Description of Dalelake Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Sand sheets

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* Southeast to southwest (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Eolian deposits derived from igneous rock

*Vegetation:* Asian mustard, common Mediterranean grass, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated): 7s*

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 4 inches; fine sand

C—4 to 59 inches; fine sand

**Minor Components**

**Pintobasin, occasionally flooded, broad soils**

*Percent of map unit:* 4 percent

*Slope:* 2 to 8 percent

*Landform:* Broad drainageways

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)

**Pintobasin, rarely flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Lower fan aprons

*Ecological site:* Hyperthermic Fans (R030XD015CA)

**Carpetflat soils**

*Percent of map unit:* 2 percent

*Slope:* 0 to 2 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

**Perurose soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)

**1520—Pintobasin loamy sand, 2 to 4 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,030 to 2,310 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Pintobasin, loamy sand and similar soils: 80 percent

Dissimilar minor components: 20 percent

**Description of Pintobasin, Loamy Sand Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments



### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northeast

*Aspect range:* Northwest to southeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, pincushion flower, and smooth desert dandelion

### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.3 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### **Typical Profile**

A—0 to 2 inches; loamy sand

Bw—2 to 14 inches; loamy sand

C1—14 to 35 inches; gravelly sand

C2—35 to 59 inches; gravelly sand

### **Minor Components**

#### **Carrizo, rarely flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Hyperthermic Fans (R030XD015CA)

#### **Joetree soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons on fan remnants

*Ecological site:* Hyperthermic Fans (R030XD015CA)

#### **Pintobasin, rarely flooded, channeled soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Upper fan aprons

*Ecological site:* Channeled Warm Alluvial Fans (R030XD041CA)

**Pintobasin, frequently flooded soils**

*Percent of map unit:* 4 percent

*Slope:* 4 to 8 percent

*Landform:* Active channels

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

**Rock outcrop**

*Percent of map unit:* 1 percent

*Slope:* 2 to 30 percent

**1522—Pintobasin gravelly sand, 1 to 3 percent slopes,  
rarely flooded**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,080 to 2,390 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Pintobasin, rarely flooded and similar soils: 85 percent

Dissimilar minor components: 15 percent

**Description of Pintobasin, Rarely Flooded Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 1 to 3 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, pincushion, and sowthistle desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; gravelly sand

AC—2 to 4 inches; gravelly sand

C1—4 to 24 inches; gravelly sand

C2—24 to 59 inches; gravelly sand

**Minor Components**

**Pintobasin soils**

*Percent of map unit:* 5 percent

*Slope:* 1 to 3 percent

*Landform:* Fan aprons

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

**Dalelake soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Sand sheets

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

**Pintobasin, occasionally flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 1 to 3 percent

*Landform:* Drainageways

*Ecological site:* Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)

**Pintobasin, frequently flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 1 to 2 percent

*Landform:* Active channels

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)

**Dalelake, thick sandy surface soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 4 percent

*Landform:* Sand sheets

*Ecological site:* Hyperthermic Sandy Plains (R030XD014CA)

**Rubylee soils**

*Percent of map unit:* 1 percent

*Slope:* 1 to 3 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

## **1523—Pintobasin-Aquapeak association, 2 to 4 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,390 to 2,390 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Pintobasin, rarely flooded and similar soils: 50 percent  
Aquapeak and similar soils: 25 percent  
Pintobasin, occasionally flooded and similar soils: 20 percent  
Dissimilar minor components: 5 percent

### **Description of Pintobasin, Rarely Flooded Soil**

#### **Classification**

Mixed, hyperthermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* Northwest to northeast (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush, burrobush, and cryptantha

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* Rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Hyperthermic Fans (R030XD015CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; gravelly sand  
AC—2 to 4 inches; gravelly sand  
C1—4 to 24 inches; gravelly sand  
C2—24 to 59 inches; gravelly sand

**Description of Aquapeak Soil**

**Classification**

Loamy, mixed, superactive, hyperthermic, shallow Argidic Argidurids

**Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* North  
*Aspect range:* Northwest to northeast (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush, cryptantha, sowthistle desertdandelion, burrobrush, grasses, and perennials

**Properties and Qualities**

*Depth to restrictive feature:* 5 to 14 inches to weakly cemented duripan  
*Shrink-swell potential:* Low (about 1.4 LEP)  
*Salinity maximum based on representative value:* Nonsaline (about 1.0 mmho/cm)  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 17

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Desert Pavement (R030XY002CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

A—0 to 0.5 inch; very gravelly fine sand  
Btkq—0.5 inch to 11 inches; fine sandy loam  
Bkqm—11 to 19 inches; cemented gravelly loamy sand  
Bkq1—19 to 33 inches; gravelly loamy sand  
Bkq2—33 to 59 inches; gravelly sand

**Description of Pintobasin, Occasionally Flooded Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Inset fans

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush and burrobush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream  
(R030XY001CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 2 inches; gravelly sand

AC—2 to 4 inches; gravelly sand

C1—4 to 24 inches; gravelly sand

C2—24 to 59 inches; gravelly sand

#### **Minor Components**

##### **Rubylee, rarely flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 0 to 2 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Fans (R030XD015CA)

## **1524—Pintobasin sand, 0 to 2 percent slopes**

#### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,655 to 1,900 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### Map Unit Composition

Pintobasin, rarely flooded and similar soils: 90 percent

Dissimilar minor components: 10 percent

### Description of Pintobasin, Rarely Flooded Soil

#### Classification

Mixed, hyperthermic Typic Torripsamments

#### Setting

*Landform*: Fan aprons

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Tread

*Down-slope shape*: Linear

*Across-slope shape*: Linear

*Aspect (representative)*: North

*Aspect range*: All aspects

*Slope range*: 0 to 2 percent

*Parent material*: Alluvium derived from granitoid

*Vegetation*: Cryptantha, creosote bush, and burrobrush

#### Properties and Qualities

*Depth to restrictive feature*: None within a depth of 60 inches

*Shrink-swell potential*: Low (about 0.2 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Somewhat excessively drained

*Flooding frequency*: Rare (see table 24)

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Low (about 3.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7s

*Ecological site*: Hyperthermic Fans (R030XD015CA)

*Hydric soil status*: No

*Hydrologic soil group*: A

#### Typical Profile

A—0 to 2 inches; sand

AC—2 to 4 inches; gravelly sand

C1—4 to 24 inches; gravelly sand

C2—24 to 59 inches; gravelly sand

### Minor Components

#### Pintobasin, occasionally flooded, broad soils

*Percent of map unit*: 5 percent

*Slope*: 0 to 2 percent

*Landform*: Broad drainageways

*Ecological site*: Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

#### Dalelake soils

*Percent of map unit*: 2 percent



*Slope:* 2 to 4 percent

*Landform:* Sand sheets

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

**Pintobasin, frequently flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Active channels

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

**Carrizo, occasionally flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

## **1525—Pintobasin complex, 2 to 4 percent slopes, flooded**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,525 to 2,590 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Pintobasin, occasionally flooded and similar soils: 45 percent

Pintobasin, rarely flooded and similar soils: 35 percent

Dissimilar minor components: 20 percent

### **Description of Pintobasin, Occasionally Flooded Soil**

#### **Classification**

Mixed, hyperthermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Northwest to north (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush and burrobush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.5 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream  
(R030XY001CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 2 inches; gravelly sand

AC—2 to 4 inches; gravelly sand

C1—4 to 24 inches; gravelly sand

C2—24 to 59 inches; gravelly sand

### Description of Pintobasin, Rarely Flooded Soil

#### Classification

Mixed, hyperthermic Typic Torripsamments

#### Setting

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Northwest to north (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush and desert Indianwheat

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.3 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; loamy sand  
Bw—2 to 14 inches; loamy sand  
C1—14 to 35 inches; gravelly sand  
C2—35 to 59 inches; gravelly sand

**Minor Components**

**Pintobasin soils**

*Percent of map unit:* 10 percent  
*Slope:* 2 to 4 percent  
*Landform:* Fan aprons  
*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

**Carrizo, frequently flooded soils**

*Percent of map unit:* 5 percent  
*Slope:* 2 to 4 percent  
*Landform:* Channels  
*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)

**Rubylee, rarely flooded soils**

*Percent of map unit:* 5 percent  
*Slope:* 1 to 4 percent  
*Landform:* Fan remnants  
*Ecological site:* Hyperthermic Fans (R030XD015CA)

**1526—Pintobasin-Joetree-Patscamp complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 655 to 2,805 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Pintobasin, rarely flooded and similar soils: 55 percent  
Joetree and similar soils: 20 percent  
Patscamp and similar soils: 15 percent  
Dissimilar minor components: 10 percent

**Description of Pintobasin, Rarely Flooded Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* Northeast

## Soil Survey of Joshua Tree National Park, California

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, burrobush, Mediterranean grass, and Panamint cryptantha

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.6 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 3 inches; loamy fine sand

AC—3 to 7 inches; loamy sand

C1—7 to 20 inches; gravelly sand

C2—20 to 59 inches; sand

## Description of Joetree Soil

### Classification

Mixed, hyperthermic Typic Torripsamments

### Setting

*Landform:* Fan aprons on fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, burrobush, big galleta, and sowthistle desertdandelion

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 2.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Moderate (about 6.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; loamy sand

C—2 to 43 inches; loamy sand

Btb—43 to 65 inches; sandy clay loam

Cb—65 to 71 inches; loamy sand

**Description of Patscamp Soil**

**Classification**

Fine-loamy, mixed, superactive, hyperthermic Calcic Paleargids

**Setting**

*Landform:* Fan aprons on fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, burrobush, big galleta, and sowthistle desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 2.8 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 15

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Moderate (about 7.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* B

**Typical Profile**

A—0 to 1 inch; loamy fine sand

C—1 to 10 inches; gravelly sand

2Btk—10 to 17 inches; sandy clay loam

2Btkq1—17 to 35 inches; gravelly sandy clay loam

2Btkq2—35 to 45 inches; sandy loam

2Bkq1—45 to 53 inches; sandy loam

2Bkq2—53 to 63 inches; gravelly sandy loam

#### **Minor Components**

##### **Pintobasin, rarely flooded, channeled soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Channeled Warm Alluvial Fans (R030XD041CA)

##### **Sunmill soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Fans (R030XD015CA)

##### **Dalelake soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 8 percent

*Landform:* Sand sheets

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

##### **Pintobasin, frequently flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 8 percent

*Landform:* Active channels

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

## **1527—Pintobasin loamy sand, 4 to 15 percent slopes**

#### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,310 to 2,460 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

#### **Map Unit Composition**

Pintobasin, moist and similar soils: 90 percent

Dissimilar minor components: 10 percent

#### **Description of Pintobasin, Moist Soil**

##### **Classification**

Mixed, hyperthermic Typic Torripsamments

##### **Setting**

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* East to west (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from gneiss and/or alluvium derived from granitoid

*Vegetation:* Brittlebush, burrobush, California barrel cactus, and creosote bush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.3 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Coarse Gravelly Fans (R030XD039CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 2 inches; loamy sand

Bw—2 to 14 inches; loamy sand

C1—14 to 35 inches; gravelly sand

C2—35 to 59 inches; gravelly sand

#### **Minor Components**

##### **Pintobasin, occasionally flooded, gravelly surface soils**

*Percent of map unit:* 7 percent

*Slope:* 4 to 8 percent

*Landform:* Inset fans

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

##### **Carrizo, frequently flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 4 to 8 percent

*Landform:* Channels

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

## **1530—Dalelake fine sand, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,015 to 1,275 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days



### Map Unit Composition

Dalelake, fine sand and similar soils: 85 percent

Dissimilar minor components: 15 percent

### Description of Dalelake, Fine Sand Soil

#### Classification

Mixed, hyperthermic Typic Torripsamments

#### Setting

*Landform*: Sand sheets

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Head slope

*Down-slope shape*: Convex

*Across-slope shape*: Linear

*Aspect (representative)*: North

*Aspect range*: North to northwest (clockwise)

*Slope range*: 0 to 4 percent

*Parent material*: Eolian deposits derived from granitoid

*Vegetation*: Creosote bush, Mediterranean grass, smooth desertdandelion, pincushion flower, and Panamint cryptantha

#### Properties and Qualities

*Depth to restrictive feature*: None within a depth of 60 inches

*Shrink-swell potential*: Low (about 0.1 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Somewhat excessively drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Low (about 4.1 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7s

*Ecological site*: Hyperthermic Sandsheets (R030XD025CA)

*Hydric soil status*: No

*Hydrologic soil group*: A

#### Typical Profile

A—0 to 4 inches; fine sand

C—4 to 59 inches; fine sand

### Minor Components

#### Pintobasin, occasionally flooded soils

*Percent of map unit*: 5 percent

*Slope*: 0 to 2 percent

*Landform*: Inset fans

*Ecological site*: Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)

#### Pintobasin soils

*Percent of map unit*: 5 percent

*Slope*: 0 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

**Typic Torriorthents**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

## **1531—Dalelake-Pintobasin complex, 0 to 4 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,570 to 1,915 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Dalelake and similar soils: 60 percent

Pintobasin, rarely flooded and similar soils: 30 percent

Dissimilar minor components: 10 percent

### **Description of Dalelake Soil**

#### **Classification**

Mixed, hyperthermic Typic Torripsamments

#### **Setting**

*Landform:* Sand sheets

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Northwest to north (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Eolian sands derived from granitoid

*Vegetation:* Creosote bush, Asian mustard, desert Indianwheat, Mediterranean grass, big galleta, cryptantha, pincushion flower, and dyebush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; fine sand  
C1—2 to 13 inches; fine sand  
C2—13 to 22 inches; fine sand  
C3—22 to 59 inches; fine sand

**Description of Pintobasin, Rarely Flooded Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* All aspects  
*Slope range:* 0 to 2 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush, burrobrush, and cryptantha

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* Rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Fans (R030XD015CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; gravelly sand  
AC—2 to 4 inches; gravelly sand  
C1—4 to 24 inches; gravelly sand  
C2—24 to 59 inches; gravelly sand

### Minor Components

#### **Joetree, overblown soils**

*Percent of map unit:* 4 percent

*Slope:* 0 to 4 percent

*Landform:* Sand sheets on fan remnants

*Ecological site:* Hyperthermic Sandy Plains (R030XD014CA)

#### **Pintobasin, frequently flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 0 to 2 percent

*Landform:* Active channels

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

#### **Rubylee, rarely flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 1 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Hyperthermic Fans (R030XD015CA)

## **1540—Carrizo-Russiroks complex, 2 to 8 percent slopes**

### Map Unit Setting

*Major land resource area:* 30—Mojave Desert

*Elevation:* 560 to 1,800 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### Map Unit Composition

Carrizo, very rarely flooded and similar soils: 35 percent

Carrizo, stable and similar soils: 25 percent

Carrizo, occasionally flooded, rocky surface and similar soils: 20 percent

Russiroks and similar soils: 20 percent

### Description of Carrizo, Very Rarely Flooded Soil

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from igneous and metamorphic rock

*Vegetation:* Cryptantha, brittlebush, annual forbs, creosote bush, and smooth  
desertdandelion

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Very rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Coarse Gravelly Fans (R030XD039CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; very gravelly sandy loam

AC—1 to 5 inches; very gravelly sandy loam

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

### **Description of Carrizo, Stable Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from igneous and metamorphic rock

*Vegetation:* Sowthistle desertdandelion, creosote bush, and brittlebush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.6 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Desert Pavement (R030XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; fine sandy loam

AC—1 to 5 inches; very gravelly loamy sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

**Description of Carrizo, Occasionally Flooded, Rocky Surface Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Inset fans

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from igneous and metamorphic rock

*Vegetation:* Brittlebush, cryptantha, creosote bush, Abrams' sandmat, smooth desertdandelion, and white ratany

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream (R030XY021CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly loamy sand

C1—1 to 5 inches; gravelly sand

C2—5 to 59 inches; very gravelly sand

**Description of Russiroks Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Typic Calciargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from igneous and metamorphic rock

*Vegetation:* Smooth desrtdandelion, creosote bush, and desert Indianwheat

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 9

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Desert Pavement (R030XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

**Typical Profile**

C—0 to 1 inch; gravel

A—1 to 2 inches; gravelly silt loam

2Btkq—2 to 7 inches; very gravelly loam

2Bkq1—7 to 30 inches; extremely gravelly sandy loam

2Bkq2—30 to 59 inches; extremely gravelly sandy loam

## **1541—Carrizo-Cambidic Haplodurids association, 4 to 15 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 520 to 750 feet

*Mean annual precipitation:* 2 to 5 inches

*Mean annual air temperature:* 68 to 79 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Carrizo, stable and similar soils: 50 percent



Cambidic Haplodurids and similar soils: 40 percent

Dissimilar minor components: 10 percent

### Description of Carrizo, Stable Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform*: Fan aprons

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Tread

*Down-slope shape*: Linear

*Across-slope shape*: Convex

*Aspect (representative)*: East

*Aspect range*: North to southeast (clockwise)

*Slope range*: 4 to 15 percent

*Parent material*: Alluvium derived from igneous and metamorphic rock

*Vegetation*: Desert marigold and desert Indianwheat

#### Properties and Qualities

*Depth to restrictive feature*: None within a depth of 60 inches

*Shrink-swell potential*: Low (about 0.6 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Excessively drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Very low (about 2.6 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7e

*Ecological site*: Desert Pavement (R030XY002CA)

*Hydric soil status*: No

*Hydrologic soil group*: A

#### Typical Profile

A—0 to 1 inch; fine sandy loam

AC—1 to 5 inches; very gravelly loamy sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

### Description of Cambidic Haplodurids

#### Classification

Cambidic Haplodurids

#### Setting

*Landform*: Fan remnants

*Landform position (two-dimensional)*: Summit

*Landform position (three-dimensional)*: Interfluvium

*Down-slope shape*: Linear

*Across-slope shape*: Convex

## Soil Survey of Joshua Tree National Park, California

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from igneous and metamorphic rock

*Vegetation:* Creosote bush, sowthistle desertdandelion, desert Indianwheat, and devil's spineflower

### Properties and Qualities

*Depth to restrictive feature:* 16 to 20 inches to moderately cemented duripan

*Shrink-swell potential:* Low (about 0.8 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.8 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

C—0 to 2 inches; gravel

A—2 to 2.5 inches; gravelly loam

Bw—2.5 to 5 inches; gravelly fine sandy loam

Bk—5 to 16 inches; extremely gravelly loamy sand

Bkq—16 to 20 inches; cemented loamy sand

C'—20 to 59 inches; very gravelly loamy sand

## Minor Components

### Cambidic Haplodurids, sandy surface

*Percent of map unit:* 5 percent

*Slope:* 0 to 4 percent

*Landform:* Fan skirts

*Ecological site:* Dune 3-5" P.Z. (R030XY154CA)

### Deprave soils

*Percent of map unit:* 3 percent

*Slope:* 4 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement 2-4" p.z. (R031XY002CA)

### Cambidic Haplodurids, rarely flooded

*Percent of map unit:* 2 percent

*Slope:* 4 to 8 percent

*Landform:* Fan aprons

*Ecological site:* Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream (R030XY021CA)

## 1542—Carrizo complex, 4 to 15 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,475 to 3,050 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### Map Unit Composition

Carrizo, very rarely flooded and similar soils: 70 percent  
Carrizo, occasionally flooded and similar soils: 20 percent  
Dissimilar minor components: 10 percent

### Description of Carrizo, Very Rarely Flooded Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform:* Fan aprons and fan remnants  
*Landform position (two-dimensional):* Summit and backslope  
*Landform position (three-dimensional):* Side slope and interfluvium  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* South  
*Aspect range:* Southeast to southwest (clockwise)  
*Slope range:* 4 to 15 percent  
*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Brittlebush, burrobush, California barrel cactus, and creosote bush

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.4 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* Very rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Coarse Gravelly Fans (R030XD039CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

#### Typical Profile

A—0 to 1 inch; sandy loam  
Bw—1 to 5 inches; very gravelly sandy loam

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

### **Description of Carrizo, Occasionally Flooded Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Inset fans

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* South

*Aspect range:* Southeast to southwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Burrobrush, Schott's dalea, smooth desertdandelion, brittlebush, and  
sowthistle desertdandelion

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; very gravelly loamy sand

Bk—1 to 5 inches; very gravelly sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; extremely gravelly sand

### **Minor Components**

#### **Carrizo, steep soils**

*Percent of map unit:* 6 percent

*Slope:* 15 to 30 percent

*Landform:* Upper alluvial fans

*Ecological site:* Coarse Gravelly Fans (R030XD039CA)

#### **Carrizo, frequently flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 8 percent

*Landform:* Channels

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

**Pintobasin, moist soils**

*Percent of map unit:* 1 percent

*Slope:* 8 to 15 percent

*Landform:* Alluvial fans

*Ecological site:* Coarse Gravelly Fans (R030XD039CA)

## **1550—Buzzardsprings-Coxpin-Dalelake complex, 2 to 8 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 950 to 1,570 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Buzzardsprings, stable and similar soils: 35 percent

Coxpin and similar soils: 25 percent

Dalelake and similar soils: 20 percent

Dissimilar minor components: 20 percent

### **Description of Buzzardsprings, Stable Soil**

#### **Classification**

Sandy, mixed, hyperthermic Typic Haplocalcids

#### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from igneous rock

*Vegetation:* Pincushion flower, desert Indianwheat, and creosote bush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 5

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Desert Pavement (R030XY002CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 3 inches; fine sandy loam  
2Bkq—3 to 25 inches; gravelly loamy sand  
2Ckq—25 to 59 inches; gravelly sand

**Description of Coxpin Soil**

**Classification**

Sandy, mixed, hyperthermic, shallow Cambidic Haplodurids

**Setting**

*Landform:* Flat fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Aspect (representative):* North  
*Aspect range:* West to northeast (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from igneous rock  
*Vegetation:* Cryptantha, burrobush, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to moderately cemented duripan  
*Shrink-swell potential:* Low (about 0.6 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 5

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; loamy fine sand  
Bw—1 to 10 inches; gravelly sandy loam  
Bk—10 to 17 inches; gravelly loamy sand  
Bkq—17 to 22 inches; cemented sand  
Ck—22 to 59 inches; sand

## Description of Dalelake Soil

### Classification

Mixed, hyperthermic Typic Torripsamments

### Setting

*Landform:* Sand sheets

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Eolian deposits derived from igneous rock

*Vegetation:* Creosote bush, Asian mustard, desert Indianwheat, Mediterranean grass, big galleta, cryptantha, pincushion flower, and dyebush

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.1 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 4 inches; fine sand

C—4 to 59 inches; fine sand

## Minor Components

### Perurose, rarely flooded soils

*Percent of map unit:* 10 percent

*Slope:* 4 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Fans (R030XD015CA)

### Pintobasin, stable soils

*Percent of map unit:* 8 percent

*Slope:* 2 to 8 percent

*Landform:* Fan aprons

*Ecological site:* Desert Pavement (R030XY002CA)



**Missionwell soils**

*Percent of map unit:* 2 percent

*Slope:* 8 to 15 percent

*Landform:* Basalt hills

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

**1555—Goldrose-Carsitas-Chemwash complex, 4 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 1,230 to 2,735 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

**Map Unit Composition**

Goldrose and similar soils: 35 percent

Carsitas, very rarely flooded and similar soils: 30 percent

Chemwash, rarely flooded and similar soils: 25 percent

Dissimilar minor components: 10 percent

**Description of Goldrose Soil**

**Classification**

Sandy, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* Northeast to southwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Sowthistle desertdandelion, creosote bush, brittlebush, and desert ironwood

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.2 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated): 7s*

*Ecological site: Rarely Flooded Fans (R031XY200CA)*

*Hydric soil status: No*

*Hydrologic soil group: A*

**Typical Profile**

A—0 to 1 inch; gravelly loamy fine sand

Bw—1 to 6 inches; gravelly sand

C1—6 to 21 inches; gravelly sand

C2—21 to 31 inches; gravelly coarse sand

C3—31 to 59 inches; very gravelly coarse sand

**Description of Carsitas, Very Rarely Flooded Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform: Fan aprons*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Tread*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Aspect (representative): West*

*Aspect range: Northeast to southwest (clockwise)*

*Slope range: 4 to 8 percent*

*Parent material: Alluvium derived from granitoid and/or alluvium derived from gneiss*

*Vegetation: Creosote bush, burrobush, brittlebush, desert Indianwheat, and lupine*

**Properties and Qualities**

*Depth to restrictive feature: None within a depth of 60 inches*

*Shrink-swell potential: Low (about 0.2 LEP)*

*Salinity maximum based on representative value: Nonsaline*

*Sodicity maximum: Not sodic*

*Calcium carbonate equivalent percent: No carbonates*

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ): High*

*Natural drainage class: Somewhat excessively drained*

*Flooding frequency: Very rare (see table 24)*

*Ponding frequency: None*

*Depth to seasonal water table: Not present within a depth of 72 inches*

*Available water capacity (entire profile): Very low (about 3.0 inches)*

**Interpretive Groups**

*Land capability subclass (nonirrigated): 7s*

*Ecological site: Rarely Flooded Fans (R031XY200CA)*

*Hydric soil status: No*

*Hydrologic soil group: A*

**Typical Profile**

A—0 to 1 inch; gravelly sand

C—1 to 59 inches; gravelly sand

**Description of Chemwash, Rarely Flooded Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* West

*Aspect range:* Northeast to southwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush, brittlebush, sowthistle desertdandelion, and burrobrush

### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### **Typical Profile**

A—0 to 2 inches; gravelly loamy coarse sand

C—2 to 67 inches; stratified extremely gravelly coarse sand to very gravelly loamy coarse sand

## **Minor Components**

### **Rizzo, extremely stony soils**

*Percent of map unit:* 7 percent

*Slope:* 8 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Extremely Stony Fan Remnants (R031XY030CA)

### **Chemwash, occasionally flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 8 percent

*Landform:* Drainageways

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

### **Rock outcrop**

*Percent of map unit:* 1 percent

*Slope:* 0 to 100 percent

## **2003—Emptygun very gravelly loamy sand, 15 to 50 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 31—Lower Colorado Desert  
*Elevation:* 1,640 to 2,030 feet  
*Mean annual precipitation:* 2 to 4 inches  
*Mean annual air temperature:* 72 to 79 degrees F  
*Frost-free period:* 360 to 365 days

### **Map Unit Composition**

Emptygun and similar soils: 100 percent

### **Description of Emptygun Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Haplocalcids

#### **Setting**

*Landform:* Ballenas  
*Landform position (two-dimensional):* Summit, backslope, and footslope  
*Landform position (three-dimensional):* Interfluvium and side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* South  
*Aspect range:* Southeast to south (clockwise)  
*Slope range:* 15 to 50 percent  
*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Brittlebush, creosote bush, cryptantha, desert Indianwheat, and sowthistle  
desertdandelion

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum based on representative value:* Nonsaline (about 1.0 mmho/cm)  
*Sodicity maximum:* Sodium adsorption ratio is about 0.2  
*Calcium carbonate equivalent percent:* 11

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.4 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Steep South Slope 2-4" p.z. (R031XY003CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 2 inches; very gravelly loamy sand

Bkq1—2 to 10 inches; gravelly sandy loam  
Bkq2—10 to 20 inches; very gravelly loamy sand  
Bkq3—20 to 60 inches; very gravelly loamy sand

## **2060—Joetree-Dalelake-Pintobasin complex, 0 to 2 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,115 to 1,605 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Joetree, very rarely flooded and similar soils: 35 percent  
Dalelake and similar soils: 30 percent  
Pintobasin, fine sandy loam and similar soils: 25 percent  
Dissimilar minor components: 10 percent

### **Description of Joetree, Very Rarely Flooded Soil**

#### **Classification**

Mixed, hyperthermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons on fan remnants  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* All aspects  
*Slope range:* 0 to 2 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 1.5 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* Very rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Moderate (about 6.7 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

*Hydric soil status:* No

*Hydrologic soil group:* B

**Typical Profile**

A—0 to 2 inches; loamy fine sand

C—2 to 39 inches; sand

Btb—39 to 59 inches; sandy loam

Cb—59 to 71 inches; loamy sand

**Description of Dalelake Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Sand sheets

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 2 percent

*Parent material:* Eolian deposits derived from granitoid

*Vegetation:* Creosote bush, Asian mustard, desert Indianwheat, Mediterranean grass, big galleta, cryptantha, pincushion flower, and dyebush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 4 inches; fine sand

C—4 to 59 inches; fine sand

**Description of Pintobasin, Fine Sandy Loam Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* All aspects  
*Slope range:* 0 to 2 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 4.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; fine sandy loam  
AC—2 to 4 inches; gravelly sand  
C1—4 to 24 inches; loamy fine sand  
C2—24 to 59 inches; loamy sand

**Minor Components**

**Patscamp, frequently flooded soils**

*Percent of map unit:* 5 percent  
*Slope:* 0 to 2 percent  
*Landform:* Drainageways on fan remnants  
*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

**Pintobasin, occasionally flooded soils**

*Percent of map unit:* 5 percent  
*Slope:* 0 to 2 percent  
*Landform:* Drainageways  
*Ecological site:* Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream  
(R030XY001CA)



## 2065—Dalelake-Aquapeak-Coxpin association, 2 to 8 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,500 to 2,460 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### Map Unit Composition

Dalelake and similar soils: 30 percent  
Aquapeak and similar soils: 25 percent  
Coxpin and similar soils: 25 percent  
Dissimilar minor components: 20 percent

### Description of Dalelake Soil

#### Classification

Mixed, hyperthermic Typic Torripsamments

#### Setting

*Landform:* Sand sheets  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Aspect (representative):* North  
*Aspect range:* Northwest to northeast (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Eolian deposits derived from granitoid  
*Vegetation:* Creosote bush, Asian mustard, desert Indianwheat, Mediterranean grass, big galleta, cryptantha, pincushion flower, and dyebush

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 4.1 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

### Typical Profile

A—0 to 4 inches; fine sand

C—4 to 59 inches; fine sand

### Description of Aquapeak Soil

#### Classification

Loamy, mixed, superactive, hyperthermic, shallow Argidic Argidurids

#### Setting

*Landform*: Fan remnants

*Landform position (two-dimensional)*: Summit

*Landform position (three-dimensional)*: Interfluve

*Down-slope shape*: Linear

*Across-slope shape*: Convex

*Aspect (representative)*: North

*Aspect range*: Northwest to northeast (clockwise)

*Slope range*: 2 to 8 percent

*Parent material*: Alluvium derived from igneous rock

*Vegetation*: Cryptantha, creosote bush, sowthistle desertdandelion, burrobrush, grasses, and perennials

#### Properties and Qualities

*Depth to restrictive feature*: 5 to 14 inches to weakly cemented duripan

*Shrink-swell potential*: Low (about 1.4 LEP)

*Salinity maximum based on representative value*: Very slightly saline (about 2.0 mmhos/cm)

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: 17

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: Moderately low

*Natural drainage class*: Well drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Very low (about 1.3 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7s

*Ecological site*: Desert Pavement (R030XY002CA)

*Hydric soil status*: No

*Hydrologic soil group*: D

### Typical Profile

C—0 to 2 inches; gravel

A—2 to 3 inches; gravelly fine sandy loam

Btkq—3 to 11 inches; fine sandy loam

Bkqm—11 to 19 inches; cemented gravelly loamy sand

Bkq1—19 to 33 inches; gravelly loamy sand

Bkq2—33 to 59 inches; gravelly sand

### Description of Coxpin Soil

#### Classification

Sandy, mixed, hyperthermic, shallow Cambidic Haplodurids

#### Setting

*Landform*: Fan remnants

*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluvium  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* Northwest to northeast (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from igneous rock  
*Vegetation:* Creosote bush, burrobush, cryptantha, and smooth desert dandelion

**Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to moderately cemented duripan  
*Shrink-swell potential:* Low (about 0.6 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 5

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; fine sand  
Bw—1 to 10 inches; gravelly sandy loam  
Bk—10 to 17 inches; gravelly loamy sand  
Bkq—17 to 22 inches; cemented sand  
Ck—22 to 59 inches; sand

**Minor Components**

**Perurose, gravelly surface soils**

*Percent of map unit:* 10 percent  
*Slope:* 2 to 15 percent  
*Landform:* Fan remnants  
*Ecological site:* Desert Pavement (R030XY002CA)

**Perurose soils**

*Percent of map unit:* 5 percent  
*Slope:* 15 to 30 percent  
*Landform:* Steep fan remnants  
*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

**Carrizo, frequently flooded soils**

*Percent of map unit:* 2 percent  
*Slope:* 2 to 4 percent  
*Landform:* Active channels

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)

**Buzzardsprings, fine sand soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)

**Carrizo soils**

*Percent of map unit:* 1 percent

*Slope:* 4 to 15 percent

*Landform:* Fan remnants

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

**Sunmill soils**

*Percent of map unit:* 1 percent

*Slope:* 15 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

## **2067—Aquapeak-Buzzardsprings-Dalelake complex, 2 to 30 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,605 to 2,390 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Aquapeak, overblown and similar soils: 30 percent

Buzzardsprings and similar soils: 25 percent

Dalelake, thick sandy surface and similar soils: 20 percent

Buzzardsprings, steep and similar soils: 15 percent

Dissimilar minor components: 10 percent

### **Description of Aquapeak, Overblown Soil**

#### **Classification**

Loamy, mixed, superactive, hyperthermic, shallow Argidic Argidurids

#### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 15 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, burrobush, cryptantha, and smooth desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* 5 to 14 inches to weakly cemented duripan

*Shrink-swell potential:* Low (about 1.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 5

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 4 inches; very gravelly loam

Btk1—4 to 9 inches; loam

Btk2—9 to 13 inches; sandy loam

Bkq—13 to 19 inches; cemented gravelly sandy loam

C—19 to 43 inches; gravelly loamy sand

2Ckq—43 to 47 inches; cemented gravelly sandy loam

2C—47 to 59 inches; gravelly sand

**Description of Buzzardsprings Soil**

**Classification**

Sandy, mixed, hyperthermic Typic Haplocalcids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 15 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, burrobush, big galleta, and sowthistle desert dandelion

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 8

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Other vegetation class name(s) and symbol(s):* Granitic Loam 3-5" P.Z.  
(031XB007CA\_2)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly fine sand

Bk1—1 to 3 inches; fine sand

Bk2—3 to 8 inches; loamy fine sand

2Bk—8 to 23 inches; sand

2Ck—23 to 60 inches; gravelly sand

**Description of Dalelake, Thick Sandy Surface Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Sand sheets

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 15 percent

*Parent material:* Eolian sands derived from granitoid and/or from gneiss

*Vegetation:* Big galleta, Asian mustard, Panamint cryptantha, Mediterranean grass,  
and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Sandy Plains (R030XD014CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; fine sand  
C1—2 to 13 inches; fine sand  
C2—13 to 22 inches; fine sand  
C3—22 to 59 inches; fine sand

**Description of Buzzardsprings, Steep Soil**

**Classification**

Sandy, mixed, hyperthermic Typic Haplocalcids

**Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* Northwest to northeast (clockwise)  
*Slope range:* 15 to 30 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Curvenut combseed, creosote bush, smooth desertdandelion, and water jacket

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 8

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Dry Hills (R030XD001CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly loamy sand  
Bk1—1 to 3 inches; fine sand  
Bk2—3 to 8 inches; loamy fine sand  
2Bk—8 to 23 inches; sand  
2Ck—23 to 60 inches; gravelly sand

**Minor Components**

**Missionsweet, moist soils**

*Percent of map unit:* 5 percent  
*Slope:* 30 to 50 percent  
*Landform:* Fan remnants  
*Ecological site:* Hyperthermic Dry Hills (R030XD001CA)



**Rainbowsend, dry soils**

*Percent of map unit:* 3 percent

*Slope:* 15 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Dry Hills (R030XD001CA)

**Typic Torriorthents**

*Percent of map unit:* 2 percent

*Slope:* 15 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Dry Hills (R030XD001CA)

**2068—Aquapeak-Carpetflat-Pintobasin complex, 0 to 4 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,555 to 2,345 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Aquapeak and similar soils: 45 percent

Carpetflat, nongravelly surface and similar soils: 35 percent

Pintobasin and similar soils: 15 percent

Dissimilar minor components: 5 percent

**Description of Aquapeak Soil**

**Classification**

Loamy, mixed, superactive, hyperthermic, shallow Argidic Argidurids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Pincushion flower, desert Indianwheat, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* 5 to 14 inches to weakly cemented duripan

*Shrink-swell potential:* Low (about 1.4 LEP)

*Salinity maximum based on representative value:* Nonsaline (about 1.0 mmho/cm)

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 17

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Desert Pavement (R030XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 0.5 inch; very gravelly fine sand

Btkq—0.5 inch to 11 inches; fine sandy loam

Bkqm—11 to 19 inches; cemented gravelly loamy sand

Bkq1—19 to 33 inches; gravelly loamy sand

Bkq2—33 to 59 inches; gravelly sand

**Description of Carpetflat, Nongravelly Surface Soil**

**Classification**

Loamy, mixed, superactive, hyperthermic, shallow Cambidic Haplodurids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, burrobush, cryptantha, and smooth desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* 4 to 14 inches to very strongly cemented duripan

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 5

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.3 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 0.5 inch; gravelly fine sand

Bk—0.5 inch to 4 inches; gravelly sandy loam  
Bkqm—4 to 15 inches; cemented loamy sand  
2C—15 to 61 inches; gravelly sand

### Description of Pintobasin Soil

#### Classification

Mixed, hyperthermic Typic Torripsamments

#### Setting

*Landform*: Fan aprons  
*Landform position (two-dimensional)*: Backslope  
*Landform position (three-dimensional)*: Tread  
*Down-slope shape*: Linear  
*Across-slope shape*: Convex  
*Aspect (representative)*: North  
*Aspect range*: All aspects  
*Slope range*: 0 to 4 percent  
*Parent material*: Alluvium derived from granitoid  
*Vegetation*: Creosote bush

#### Properties and Qualities

*Depth to restrictive feature*: None within a depth of 60 inches  
*Shrink-swell potential*: Low (about 0.2 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High  
*Natural drainage class*: Somewhat excessively drained  
*Flooding frequency*: None  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Low (about 3.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7s  
*Ecological site*: Dry Deep Sandy Fan Aprons (R030XD006CA)  
*Hydric soil status*: No  
*Hydrologic soil group*: A

#### Typical Profile

A—0 to 1 inch; fine sand  
AC—1 to 4 inches; gravelly sand  
C1—4 to 24 inches; gravelly sand  
C2—24 to 59 inches; gravelly sand

### Minor Components

#### Missionsweet soils

*Percent of map unit*: 2 percent  
*Slope*: 4 to 15 percent  
*Landform*: Fan remnants  
*Ecological site*: Low-Production Hyperthermic Hills (R030XD004CA)

#### Carrizo, occasionally flooded, rocky surface soils

*Percent of map unit*: 1 percent  
*Slope*: 0 to 2 percent

*Landform:* Inset fans

*Ecological site:* Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream (R030XY021CA)

**Rubylee, nongravelly surface soils**

*Percent of map unit:* 1 percent

*Slope:* 1 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)

**Rubylee soils**

*Percent of map unit:* 1 percent

*Slope:* 1 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

## **2070—Missionsweet-Carpetflat association, 2 to 30 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,540 to 2,540 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Missionsweet and similar soils: 60 percent

Carpetflat and similar soils: 25 percent

Dissimilar minor components: 15 percent

### **Description of Missionsweet Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Cambidic Haplodurids

#### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northwest

*Aspect range:* Southwest to northeast (clockwise)

*Slope range:* 8 to 30 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, desert Indianwheat, pincushion flower, curvenut combseed, and sowthistle desertdandelion

#### **Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to strongly cemented duripan

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 5

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Very low  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.0 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

C—0 to 2 inches; gravel  
A—2 to 3 inches; very gravelly loam  
Bk—3 to 11 inches; extremely gravelly loam  
Bkq—11 to 17 inches; extremely gravelly sandy loam  
Bkqm—17 to 27 inches; cemented material

**Description of Carpetflat Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids

**Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* Northwest  
*Aspect range:* Southwest to northeast (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Pincushion flower, desert Indianwheat, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* 7 to 14 inches to very strongly cemented duripan  
*Shrink-swell potential:* Low (about 1.9 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 5

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Very low  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Desert Pavement (R030XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

C—0 to 2 inches; gravel

A—2 to 4 inches; gravelly silt loam

Bw—4 to 7 inches; very gravelly sandy loam

Bk—7 to 13 inches; very gravelly sandy loam

Bkqm1—13 to 16 inches; cemented loamy sand

Bkqm2—16 to 26 inches; cemented material

**Minor Components**

**Carrizo, occasionally flooded, rocky surface soils**

*Percent of map unit:* 6 percent

*Slope:* 2 to 4 percent

*Landform:* Bars of drainageways

*Ecological site:* Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream (R030XY021CA)

**Rubylee soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

**Carrizo, occasionally flooded, channeled soils**

*Percent of map unit:* 4 percent

*Slope:* 2 to 4 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)

**2075—Oldale-Missionsweet association, 0 to 15 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,720 to 2,325 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Oldale and similar soils: 50 percent

Missionsweet and similar soils: 30 percent

Dissimilar minor components: 20 percent

**Description of Oldale Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* West to east (clockwise)  
*Slope range:* 0 to 4 percent  
*Parent material:* Eolian deposits over alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Pincushion flower, desert Indianwheat, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 1.8 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 3

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Desert Pavement (R030XY002CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* C

**Typical Profile**

C—0 to 2 inches; gravel  
A1—2 to 3 inches; very gravelly silt loam  
A2—3 to 6 inches; gravelly silt loam  
2Bt1—6 to 15 inches; extremely gravelly loam  
2Bt2—15 to 27 inches; extremely gravelly sandy loam  
2C—27 to 59 inches; very gravelly loamy sand

**Description of Missionsweet Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Cambidic Haplodurids

**Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* West to east (clockwise)  
*Slope range:* 8 to 15 percent



## Soil Survey of Joshua Tree National Park, California

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, desert Indianwheat, pincushion flower, curvenut combseed, and sowthistle desertdandelion

### Properties and Qualities

*Depth to restrictive feature:* 14 to 20 inches to strongly cemented duripan

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 5

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Very low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.0 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

C—0 to 2 inches; gravel

A—2 to 3 inches; very gravelly loam

Bk—3 to 11 inches; extremely gravelly loam

Bkq—11 to 17 inches; extremely gravelly sandy loam

Bkqm—17 to 27 inches; cemented material

## Minor Components

### Carrizo, occasionally flooded, channeled soils

*Percent of map unit:* 10 percent

*Slope:* 0 to 4 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)

### Carpetflat soils

*Percent of map unit:* 8 percent

*Slope:* 0 to 2 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

### Missionsweet, steep soils

*Percent of map unit:* 1 percent

*Slope:* 15 to 50 percent

*Landform:* Steep side slopes above drainages

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

### Rock outcrop

*Percent of map unit:* 1 percent

*Slope:* 4 to 50 percent

## 2076—Oldale-Carrizo complex, 2 to 8 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,230 to 3,510 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### Map Unit Composition

Oldale and similar soils: 40 percent  
Carrizo and similar soils: 30 percent  
Dissimilar minor components: 30 percent

### Description of Oldale Soil

#### Classification

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids

#### Setting

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* Southeast  
*Aspect range:* East to south (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Eolian deposits over alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Pincushion flower, desert Indianwheat, and creosote bush

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 1.8 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 3

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.1 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Desert Pavement (R030XY002CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* C

#### Typical Profile

C—0 to 2 inches; gravel  
A1—2 to 4 inches; extremely gravelly loam

A2—4 to 7 inches; gravelly silt loam  
2Bt1—7 to 16 inches; extremely gravelly loam  
2Bt2—16 to 28 inches; extremely gravelly sandy loam  
2C—28 to 59 inches; very gravelly loamy sand

### Description of Carrizo Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southeast

*Aspect range:* East to south (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from mixed sources

*Vegetation:* Creosote bush

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### Typical Profile

A—0 to 1 inch; very gravelly sandy loam

AC—1 to 5 inches; very gravelly loamy sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

### Minor Components

#### Carrizo, occasionally flooded, channeled soils

*Percent of map unit:* 10 percent

*Slope:* 0 to 2 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Goldenbell soils**

*Percent of map unit:* 7 percent

*Slope:* 2 to 4 percent

*Landform:* Broad fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

**Missionsweet soils**

*Percent of map unit:* 6 percent

*Slope:* 8 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

**Carrizo, occasionally flooded, rocky surface soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Inset fans

*Ecological site:* Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream (R030XY021CA)

**Pintobasin, very rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 0 to 2 percent

*Landform:* Fan aprons

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

**2077—Oldale-Carrizo association, 0 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 655 to 1,295 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Oldale and similar soils: 50 percent

Carrizo and similar soils: 25 percent

Carrizo, very rarely flooded and similar soils: 15 percent

Dissimilar minor components: 10 percent

**Description of Oldale Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* Southeast to southwest (clockwise)

*Slope range:* 0 to 8 percent

*Parent material:* Eolian deposits over alluvium derived from granitoid

*Vegetation:* Pincushion flower, desert Indianwheat, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.8 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.8 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Desert Pavement (R030XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

**Typical Profile**

C—0 to 2 inches; gravel

A1—2 to 3 inches; very gravelly silt loam

A2—3 to 6 inches; gravelly silt loam

2Bt1—6 to 9 inches; extremely gravelly loam

2Bt2—9 to 16 inches; extremely gravelly sandy loam

2C—16 to 59 inches; very gravelly loamy sand

**Description of Carrizo Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* Southeast to southwest (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from mixed sources

*Vegetation:* Creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; fine sandy loam

AC—1 to 5 inches; very gravelly loamy sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

**Description of Carrizo, Very Rarely Flooded Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* Southeast to southwest (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from mixed sources

*Vegetation:* Creosote bush, sowthistle desertdandelion, brittlebush, and cryptantha

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Very rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Coarse Gravelly Fans (R030XD039CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; very gravelly sandy loam

AC—1 to 5 inches; very gravelly sandy loam

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; very gravelly sand

#### Minor Components

##### **Carrizo, occasionally flooded, rocky surface soils**

*Percent of map unit:* 10 percent

*Slope:* 4 to 15 percent

*Landform:* Inset fans

*Ecological site:* Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream (R030XY021CA)

## **2085—Rainbowsend-Goldenbell complex, 4 to 50 percent slopes**

#### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,685 to 3,180 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

#### Map Unit Composition

Rainbowsend and similar soils: 45 percent

Goldenbell and similar soils: 35 percent

Dissimilar minor components: 20 percent

#### Description of Rainbowsend Soil

##### **Classification**

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids

##### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Southwest to east (clockwise)

*Slope range:* 8 to 50 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

##### **Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to indurated duripan

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 9

##### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Very low

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None



*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.8 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

C—0 to 6 inches; stones

A—6 to 7 inches; very gravelly loamy sand

Bkq1—7 to 15 inches; very gravelly fine sandy loam

Bkq2—15 to 18 inches; very gravelly sandy loam

Bkqm—18 to 28 inches; cemented material

**Description of Goldenbell Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Argidic Argidurids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Southwest to east (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Pincushion flower, desert Indianwheat, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* 10 to 14 inches to moderately cemented duripan

*Shrink-swell potential:* Low (about 1.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.9 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Desert Pavement (R030XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

C—0 to 2 inches; gravel

Aq—2 to 3 inches; extremely gravelly fine sandy loam

Btq—3 to 11 inches; very gravelly sandy loam

Bkqm—11 to 16 inches; cemented very gravelly sand  
Ckq—16 to 59 inches; extremely gravelly sand

#### **Minor Components**

##### **Blackeagle, cool soils**

*Percent of map unit:* 10 percent

*Slope:* 30 to 50 percent

*Landform:* Hills

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

##### **Carrizo, occasionally flooded, channeled soils**

*Percent of map unit:* 5 percent

*Slope:* 1 to 2 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

##### **Rock outcrop**

*Percent of map unit:* 5 percent

*Slope:* 1 to 50 percent

## **2090—Deprave-Rockhound-Rizzo complex, 2 to 4 percent slopes**

#### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 915 to 1,720 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

#### **Map Unit Composition**

Deprave and similar soils: 35 percent

Rockhound and similar soils: 25 percent

Rizzo and similar soils: 20 percent

Dissimilar minor components: 20 percent

#### **Description of Deprave Soil**

##### **Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids

##### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Brittlebush, creosote bush, sowthistle desertdandelion, and desert Indianwheat

**Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to very weakly cemented duripan

*Shrink-swell potential:* Low (about 1.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 4

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Desert Pavement 2-4" p.z. (R031XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

**Typical Profile**

C—0 to 2 inches; gravel

A—2 to 4 inches; gravelly loam

Btk—4 to 15 inches; very gravelly sandy clay loam

Bq—15 to 39 inches; very gravelly loamy sand

Bqcm—39 to 63 inches; cemented very gravelly sand

**Description of Rockhound Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Creosote bush, brittlebush, desert Indianwheat, and sowthistle  
desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 2.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 4.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Desert Pavement 2-4" p.z. (R031XY002CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* B

**Typical Profile**

C—0 to 2 inches; extremely gravelly loam  
A—2 to 4 inches; very gravelly loam  
Bk—4 to 7 inches; very gravelly loam  
Btq1—7 to 17 inches; gravelly loam  
Btq2—17 to 34 inches; extremely gravelly sandy clay loam  
Bkq—34 to 59 inches; very gravelly sandy loam

**Description of Rizzo Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* East  
*Aspect range:* North to southeast (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Alluvium derived from granitoid and/or gneiss  
*Vegetation:* Creosote bush, sowthistle desertdandelion, Schott's dalea, desert Indianwheat, and cushion foxtail cactus

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Gravelly Fan Remnants And Fan Aprons (R031XY009CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; extremely cobbly sandy loam  
C1—1 to 9 inches; very gravelly loamy coarse sand

C2—9 to 19 inches; very gravelly loamy coarse sand

Ck—19 to 59 inches; very gravelly coarse sand

#### **Minor Components**

##### **Roostertail, stable soils**

*Percent of map unit:* 10 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement 2-4" p.z. (R031XY002CA)

##### **Rizzo, frequently flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 8 percent

*Landform:* Drainageways

*Ecological site:* Large, High Intensity, Frequently Flooded Ephemeral Stream  
(R031XY026CA)

##### **Rizzo, occasionally flooded, rocky surface soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 8 percent

*Landform:* Inset fans

*Ecological site:* Very Gravelly Wash (R031XY021CA)

##### **Deprave, moderately steep soils**

*Percent of map unit:* 2 percent

*Slope:* 15 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Limy Hill 2-4" p.z. (R031XY004CA)

##### **Kenalduma soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 15 percent

*Landform:* Steep fan remnants

*Ecological site:* Cobbly Fan Remnants (R031XY201CA)

## **2091—Deprave-Roostertail association, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 490 to 735 feet

*Mean annual precipitation:* 2 to 5 inches

*Mean annual air temperature:* 68 to 79 degrees F

*Frost-free period:* 300 to 365 days

#### **Map Unit Composition**

Deprave and similar soils: 60 percent

Roostertail and similar soils: 15 percent

Dissimilar minor components: 25 percent

#### **Description of Deprave Soil**

##### **Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 2 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Brittlebush, creosote bush, sowthistle desertdandelion, and desert Indianwheat

**Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to very weakly cemented duripan

*Shrink-swell potential:* Low (about 1.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 4

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Desert Pavement 2-4" p.z. (R031XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

**Typical Profile**

C—0 to 1 inch; gravel

A—1 to 2 inches; gravelly loam

Btk—2 to 13 inches; very gravelly sandy clay loam

Bq—13 to 24 inches; very gravelly loamy sand

Bkqm—24 to 63 inches; cemented very gravelly sand

**Description of Roostertail Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Duric Petroargids

**Setting**

*Landform:* Fan aprons and lower fan remnants

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 4 percent

*Parent material:* Eolian deposits derived from granitoid and metamorphic rock over alluvium derived from granitoid and metamorphic rock

*Vegetation:* Creosote bush and white ratany

**Properties and Qualities**

*Depth to restrictive feature:* 39 to 59 inches to strongly cemented duripan

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 35

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.3 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy 2-4" p.z. (R031XY006CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

C—0 to 1 inch; gravel

A—1 to 2 inches; very gravelly fine sandy loam

2Btkq1—2 to 4 inches; extremely gravelly sandy loam

2Btkq2—4 to 29 inches; very gravelly sandy loam

2Bkq—29 to 56 inches; gravelly sand

2Bkqm—56 to 60 inches; cemented material

3Bk—60 to 69 inches; fine sand

**Minor Components**

**Snaggletooth soils**

*Percent of map unit:* 10 percent

*Slope:* 0 to 2 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement 2-4" p.z. (R031XY002CA)

**Typic Torriorthents, frequently flooded**

*Percent of map unit:* 10 percent

*Slope:* 0 to 4 percent

*Landform:* Drainageways

*Ecological site:* Frequently Flooded, Confined Ephemeral Stream (R031XY029CA)

**Descent soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 15 percent

*Landform:* Fan remnants

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

**2100—Perurose-Coxpin-Pintobasin association, 2 to 15 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 950 to 2,555 feet



## Soil Survey of Joshua Tree National Park, California

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### Map Unit Composition

Perurose and similar soils: 50 percent

Coxpin and similar soils: 25 percent

Pintobasin, gravelly surface and similar soils: 15 percent

Dissimilar minor components: 10 percent

### Description of Perurose Soil

#### Classification

Sandy, mixed, hyperthermic Cambidic Haplodurids

#### Setting

*Landform:* Fan remnants

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southeast

*Aspect range:* North to west (clockwise)

*Slope range:* 2 to 15 percent

*Parent material:* Alluvium derived from gneiss and/or alluvium derived from granitoid

*Vegetation:* Creosote bush, white ratany, and burrobush

#### Properties and Qualities

*Depth to restrictive feature:* 20 to 39 inches to moderately cemented duripan

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 8

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### Typical Profile

C—0 to 2 inches; gravel

A—2 to 3 inches; loamy fine sand

Bk—3 to 7 inches; loamy fine sand

Bkq—7 to 18 inches; loamy sand

C'—18 to 30 inches; sand

2Bkqm—30 to 43 inches; cemented sand

2C—43 to 61 inches; gravelly sand

### Description of Cospin Soil

#### Classification

Sandy, mixed, hyperthermic, shallow Cambidic Haplodurids

#### Setting

*Landform*: Fan aprons on fan remnants

*Landform position (two-dimensional)*: Summit

*Landform position (three-dimensional)*: Interfluve

*Down-slope shape*: Linear

*Across-slope shape*: Convex

*Aspect (representative)*: Southeast

*Aspect range*: North to west (clockwise)

*Slope range*: 2 to 8 percent

*Parent material*: Alluvium derived from gneiss and/or alluvium derived from granitoid

*Vegetation*: Creosote bush, big galleta, Asian mustard, and desert trumpet

#### Properties and Qualities

*Depth to restrictive feature*: 14 to 20 inches to moderately cemented duripan

*Shrink-swell potential*: Low (about 0.6 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: 5

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: Moderately low

*Natural drainage class*: Somewhat excessively drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Very low (about 1.4 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7e

*Ecological site*: Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

*Hydric soil status*: No

*Hydrologic soil group*: C

#### Typical Profile

A—0 to 2 inches; fine sandy loam

Bw—2 to 10 inches; loamy fine sand

Bk—10 to 17 inches; gravelly loamy sand

Bkq—17 to 22 inches; cemented sand

Ck—22 to 59 inches; fine sandy loam

### Description of Pintobasin, Gravelly Surface Soil

#### Classification

Mixed, hyperthermic Typic Torripsamments

#### Setting

*Landform*: Fan aprons on fan remnants

*Landform position (two-dimensional)*: Summit

*Landform position (three-dimensional)*: Tread

*Down-slope shape*: Linear

*Across-slope shape*: Convex

*Aspect (representative)*: Southeast

*Aspect range:* North to west (clockwise)

*Slope range:* 2 to 15 percent

*Parent material:* Alluvium derived from gneiss and/or alluvium derived from granitoid

*Vegetation:* Creosote bush, burrobush, cryptantha, and smooth desertdandelion

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.3 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 2 inches; loamy sand

Bw—2 to 14 inches; loamy sand

C1—14 to 35 inches; gravelly sand

C2—35 to 59 inches; gravelly sand

#### **Minor Components**

##### **Pintobasin, rarely flooded, channeled soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 15 percent

*Landform:* Dissected fan remnants

*Ecological site:* Channeled Warm Alluvial Fans (R030XD041CA)

##### **Rubylee, sandy surface soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

##### **Aquapeak, extremely stony soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

##### **Carpetflat, sandy substratum soils**

*Percent of map unit:* 1 percent

*Slope:* 4 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Channeled Warm Alluvial Fans (R030XD041CA)

**Pintobasin, steep soils**

*Percent of map unit:* 1 percent

*Slope:* 30 to 50 percent

*Landform:* Side slopes of fan remnants

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

**2101—Perurose-Pintobasin complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 950 to 1,495 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Perurose, rarely flooded and similar soils: 60 percent

Pintobasin, rarely flooded and similar soils: 35 percent

Dissimilar minor components: 5 percent

**Description of Perurose, Rarely Flooded Soil**

**Classification**

Sandy, mixed, hyperthermic Cambidic Haplodurids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southwest

*Aspect range:* South to west (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush, burrobush, big galleta, and sowthistle desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to moderately cemented duripan

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 8

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; sand

Bk—1 to 5 inches; loamy fine sand

Bkq—5 to 16 inches; loamy sand

C—16 to 28 inches; sand

2Bkqm—28 to 41 inches; cemented sand

2C—41 to 59 inches; gravelly sand

**Description of Pintobasin, Rarely Flooded Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southwest

*Aspect range:* South to west (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush, burrobush, and big galleta

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Fans (R030XD015CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; sand

AC—2 to 4 inches; gravelly sand

C1—4 to 24 inches; gravelly sand

C2—24 to 59 inches; gravelly sand

### Minor Components

#### Coxpin soils

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants

(R030XD042CA)

## 2110—Descent association, 4 to 50 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 590 to 1,195 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### Map Unit Composition

Descent and similar soils: 80 percent

Descent, stable and similar soils: 15 percent

Dissimilar minor components: 5 percent

### Description of Descent Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform:* Ballenas

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southwest

*Aspect range:* Southeast to west (clockwise)

*Slope range:* 8 to 50 percent

*Parent material:* Alluvium derived from granitoid and/or from gneiss

*Vegetation:* Desert Indianwheat, sowthistle desertdandelion, and creosote bush

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 13

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.6 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

C—0 to 2 inches; extremely channery loamy fine sand

Akq—2 to 2.5 inches; channery loamy fine sand

Bkq1—2.5 to 7 inches; extremely channery fine sandy loam

Bkq2—7 to 17 inches; very channery loamy sand

Bkq3—17 to 59 inches; extremely channery sand

### Description of Descent, Stable Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform:* Ballenas

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southwest

*Aspect range:* Southeast to west (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or from gneiss

*Vegetation:* Pincushion flower, desert Indianwheat, and creosote bush

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.8 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 13

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.5 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Desert Pavement (R030XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

C—0 to 0.5 inch; channers

Akq—0.5 inch to 2 inches; channery fine sandy loam

Bkq1—2 to 7 inches; extremely channery fine sandy loam

Bkq2—7 to 17 inches; very channery loamy sand

Bkq3—17 to 59 inches; extremely channery sand



### Minor Components

#### **Carrizo, occasionally flooded, rocky surface soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 8 percent

*Landform:* Drainageways

*Ecological site:* Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream (R030XY021CA)

## **2111—Descent-Rubylee association, 8 to 50 percent slopes**

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,475 to 2,165 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

### Map Unit Composition

Descent, warm and similar soils: 45 percent

Rubylee, very rarely flooded and similar soils: 40 percent

Dissimilar minor components: 15 percent

### Description of Descent, Warm Soil

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* East to west (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Alluvium derived from granitoid and/or from gneiss

*Vegetation:* Brittlebush, desert Indianwheat, and California fagonbush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 13

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.6 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### **Typical Profile**

C—0 to 2 inches; extremely channery loamy fine sand

Akq—2 to 2 inches; channery loamy fine sand

Bkq1—2 to 7 inches; extremely channery fine sandy loam

Bkq2—7 to 17 inches; very channery loamy sand

Bkq3—17 to 59 inches; extremely channery sand

### **Description of Rubylee, Very Rarely Flooded Soil**

#### **Classification**

Coarse-loamy, mixed, superactive, hyperthermic Typic Haplargids

#### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* East to west (clockwise)

*Slope range:* 8 to 15 percent

*Parent material:* Alluvium derived from granitoid and/or from gneiss

*Vegetation:* Cryptantha, brittlebush, annual forbs, creosote bush, and smooth desertdandelion

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.7 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Coarse Gravelly Fans (R030XD039CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### **Typical Profile**

A—0 to 2 inches; fine sandy loam

Bt—2 to 5 inches; gravelly sandy loam

Btkq—5 to 18 inches; gravelly sandy loam

Bkq—18 to 59 inches; gravelly loamy sand

### Minor Components

#### Rock outcrop

*Percent of map unit:* 10 percent

*Slope:* 2 to 100 percent

#### Carrizo, occasionally flooded soils

*Percent of map unit:* 5 percent

*Slope:* 2 to 8 percent

*Landform:* Inset fans

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)

## 2120—Rizzo-Deprave complex, 2 to 8 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 540 to 1,065 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

### Map Unit Composition

Rizzo, rarely flooded and similar soils: 35 percent

Deprave and similar soils: 35 percent

Rizzo, frequently flooded and similar soils: 20 percent

Dissimilar minor components: 10 percent

### Description of Rizzo, Rarely Flooded Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform:* Drainageways and bars

*Landform position (two-dimensional):* Footslope and toeslope

*Landform position (three-dimensional):* Base slope and tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Cryptantha, brittlebush, and creosote bush

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Rarely Flooded Fans (R031XY200CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; loamy fine sand

C1—1 to 9 inches; very gravelly loamy coarse sand

C2—9 to 19 inches; very gravelly loamy coarse sand

Ck—19 to 59 inches; very gravelly coarse sand

**Description of Deprave Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Nose slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush and brittlebush

**Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to very weakly cemented duripan

*Shrink-swell potential:* Low (about 1.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 4

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Desert Pavement 2-4" p.z. (R031XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

**Typical Profile**

C—0 to 1 inch; gravel

A—1 to 2 inches; gravelly loam

Btk—2 to 13 inches; very gravelly sandy clay loam  
Bq—13 to 33 inches; very gravelly loamy sand  
Bkqm—33 to 63 inches; cemented very gravelly sand

### **Description of Rizzo, Frequently Flooded Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Channels

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush, cryptantha, desert ironwood, sowthistle desertdandelion, and Asian mustard

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Frequent (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Frequently Flooded, Confined Ephemeral Stream (R031XY029CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

C1—0 to 4 inches; gravelly coarse sand

C2—4 to 12 inches; very gravelly loamy coarse sand

C3—12 to 59 inches; very gravelly coarse sand

### **Minor Components**

#### **Rizzo, very rarely flooded soils**

*Percent of map unit:* 10 percent

*Slope:* 2 to 15 percent

*Landform:* Fan aprons

*Ecological site:* Limy 2-4" p.z. (R031XY006CA)

## **2121—Rizzo very cobbly coarse sandy loam, 4 to 15 percent slopes, rubbly**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 31—Lower Colorado Desert  
*Elevation:* 1,835 to 2,620 feet  
*Mean annual precipitation:* 2 to 4 inches  
*Mean annual air temperature:* 73 to 79 degrees F  
*Frost-free period:* 360 to 365 days

### **Map Unit Composition**

Rizzo, rubbly and similar soils: 90 percent  
Dissimilar minor components: 10 percent

### **Description of Rizzo, Rubbly Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Alluvial fans  
*Landform position (two-dimensional):* Shoulder  
*Landform position (three-dimensional):* Riser  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* Southeast  
*Aspect range:* Northeast to south (clockwise)  
*Slope range:* 4 to 15 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush, teddybear cholla, California barrel cactus, and chia

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.0 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Extremely Stony Fan Remnants (R031XY030CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; very cobbly coarse sandy loam  
C1—1 to 9 inches; very gravelly loamy coarse sand

C2—9 to 19 inches; very gravelly loamy coarse sand

Ck—19 to 59 inches; very gravelly coarse sand

#### Minor Components

##### **Rizzo, frequently flooded soils**

*Percent of map unit:* 10 percent

*Slope:* 4 to 15 percent

*Landform:* Channels

*Ecological site:* Large, High Intensity, Frequently Flooded Ephemeral Stream

(R031XY026CA)

## **2130—Goldenbell-Descent association, 2 to 15 percent slopes**

#### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 570 to 950 feet

*Mean annual precipitation:* 2 to 5 inches

*Mean annual air temperature:* 68 to 79 degrees F

*Frost-free period:* 300 to 365 days

#### Map Unit Composition

Goldenbell and similar soils: 55 percent

Descent and similar soils: 40 percent

Dissimilar minor components: 5 percent

#### Description of Goldenbell Soil

##### **Classification**

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Argidic Argidurids

##### **Setting**

*Landform:* Broad fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Cryptantha, desert Indianwheat, low woollygrass, and smooth desert dandelion

##### **Properties and Qualities**

*Depth to restrictive feature:* 10 to 14 inches to moderately cemented duripan

*Shrink-swell potential:* Low (about 1.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

##### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained



*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.0 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Desert Pavement (R030XY002CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

C—0 to 2 inches; gravel

Aq—2 to 3 inches; loam

Btq—3 to 11 inches; very gravelly loam

Bkq—11 to 16 inches; cemented very gravelly sand

Ckq—16 to 59 inches; extremely gravelly sand

**Description of Descent Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from granitoid and/or from gneiss

*Vegetation:* Creosote bush and sowthistle desert dandelion

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 13

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

Akq—0 to 1 inch; loamy fine sand

Bkq1—1 to 7 inches; extremely channery fine sandy loam

Bkq2—7 to 17 inches; very channery loamy sand

Bkq3—17 to 59 inches; extremely channery sand

#### Minor Components

##### **Rizzo, frequently flooded soils**

*Percent of map unit:* 4 percent

*Slope:* 2 to 15 percent

*Landform:* Channels

*Ecological site:* Frequently Flooded, Confined Ephemeral Stream (R031XY029CA)

##### **Descent, eroded soils**

*Percent of map unit:* 1 percent

*Slope:* 15 to 30 percent

*Landform:* Steep fan remnants

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

## **2140—Rockhound extremely gravelly loam, 4 to 15 percent slopes**

#### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 1,770 to 2,015 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

#### Map Unit Composition

Rockhound, cobbly and similar soils: 85 percent

Dissimilar minor components: 15 percent

#### Description of Rockhound, Cobbly Soil

##### **Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids

##### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* East to west (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush, buckwheat, chia, California fagonbush, and lupine

##### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.3 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Cobbly Fan Remnants (R031XY201CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

### **Typical Profile**

C—0 to 3 inches; extremely gravelly loam

A—3 to 4 inches; gravelly silt loam

Bt—4 to 34 inches; very gravelly loam

Bkq—34 to 59 inches; very gravelly sand

### **Minor Components**

#### **Rockhound, rarely flooded soils**

*Percent of map unit:* 10 percent

*Slope:* 4 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Rarely Flooded Fans (R031XY200CA)

#### **Rizzo, occasionally flooded, stony soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 8 percent

*Landform:* Inset fans

*Ecological site:* Stony, Occasionally Flooded Ephemeral Stream (R031XY202CA)

## **2402—Rizzo complex, 2 to 8 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 540 to 1,685 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

### **Map Unit Composition**

Rizzo and similar soils: 70 percent

Rizzo, frequently flooded and similar soils: 20 percent

Dissimilar minor components: 10 percent

### **Description of Rizzo Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* East  
*Aspect range:* North to southeast (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from igneous rock  
*Vegetation:* Creosote bush, brittlebush, pincushion flower, and sandmat

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Gravelly Fan Remnants And Fan Aprons (R031XY009CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; gravelly loamy coarse sand  
C1—2 to 9 inches; very gravelly loamy coarse sand  
C2—9 to 19 inches; very gravelly loamy coarse sand  
Ck—19 to 59 inches; very gravelly coarse sand

**Description of Rizzo, Frequently Flooded Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Drainageways  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave  
*Aspect (representative):* East  
*Aspect range:* North to southeast (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from igneous rock  
*Vegetation:* Desert lavender, burrobrush, sweetbush, and smoketree

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Frequent (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Large, High Intensity, Frequently Flooded Ephemeral Stream  
(R031XY026CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; extremely gravelly coarse sand

C1—1 to 9 inches; very gravelly loamy coarse sand

C2—9 to 19 inches; very gravelly loamy coarse sand

Ck—19 to 59 inches; very gravelly coarse sand

#### **Minor Components**

##### **Deprave soils**

*Percent of map unit:* 7 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement 2-4" p.z. (R031XY002CA)

##### **Carsitas soils**

*Percent of map unit:* 1 percent

*Slope:* 15 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Limy Hill 2-4" p.z. (R031XY004CA)

##### **Catfishbay soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Limy 2-4" p.z. (R031XY006CA)

##### **Rock outcrop**

*Percent of map unit:* 1 percent

*Slope:* 1 to 30 percent

## **2403—Rizzo-Rizzo, occasionally flooded complex, 2 to 8 percent slopes**

#### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 540 to 2,620 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

### **Map Unit Composition**

Rizzo and similar soils: 80 percent

Rizzo, occasionally flooded and similar soils: 15 percent

Dissimilar minor components: 5 percent

### **Description of Rizzo Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Broad, flat fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southwest

*Aspect range:* Southeast to west (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from igneous rock

*Vegetation:* Creosote bush, Schott's dalea, sowthistle desert dandelion, and desert Indianwheat

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.0 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Gravelly Fan Remnants And Fan Aprons (R031XY009CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; very gravelly fine sandy loam

Bw—1 to 7 inches; very gravelly loamy coarse sand

C1—7 to 20 inches; very gravelly loamy coarse sand

C2—20 to 59 inches; very gravelly coarse sand

### **Description of Rizzo, Occasionally Flooded Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

### **Setting**

*Landform:* Incised drainageways

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southwest

*Aspect range:* Southeast to west (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from igneous rock

*Vegetation:* Brittlebush, catclaw acacia, creosote bush, and desert lavender

### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Coarse Gravelly Wash (R031XY019CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### **Typical Profile**

C1—0 to 4 inches; gravelly coarse sand

C2—4 to 12 inches; very gravelly loamy coarse sand

C3—12 to 59 inches; very gravelly coarse sand

### **Minor Components**

#### **Deprave soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement 2-4" p.z. (R031XY002CA)

#### **Rizzo soils**

*Percent of map unit:* 2 percent

*Slope:* 15 to 30 percent

*Landform:* Side slopes of fan remnants

*Ecological site:* Limy Hill 2-4" p.z. (R031XY004CA)

## **2404—Rizzo complex, 2 to 8 percent slopes, channeled**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert



*Elevation:* 980 to 2,690 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

#### **Map Unit Composition**

Rizzo, occasionally flooded and similar soils: 60 percent

Rizzo, very rarely flooded and similar soils: 35 percent

Dissimilar minor components: 5 percent

#### **Description of Rizzo, Occasionally Flooded Soil**

##### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

##### **Setting**

*Landform:* Drainageways

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* Southeast

*Aspect range:* Northeast to south (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from igneous and metamorphic rock

*Vegetation:* Burrobrush, blue paloverde, Schott's dalea, and desert lavender

##### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

##### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.0 inches)

##### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

##### **Typical Profile**

A—0 to 2 inches; gravelly loamy coarse sand

C1—2 to 9 inches; very gravelly loamy coarse sand

C2—9 to 19 inches; very gravelly loamy coarse sand

Ck—19 to 59 inches; very gravelly coarse sand

#### **Description of Rizzo, Very Rarely Flooded Soil**

##### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Inset fans

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* Northeast to south (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from igneous and metamorphic rock

*Vegetation:* Creosote bush, brittlebush, sowthistle desertdandelion, and burrobrush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Very rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; loamy fine sand

C1—1 to 9 inches; very gravelly loamy coarse sand

C2—9 to 19 inches; very gravelly loamy coarse sand

Ck—19 to 59 inches; very gravelly coarse sand

**Minor Components****Rizzo, frequently flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 8 percent

*Landform:* Active channels

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

**Riverwash**

*Percent of map unit:* 2 percent

*Slope:* 2 to 8 percent

**2405—Carrizo complex, 0 to 4 percent slopes****Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,390 to 2,590 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

#### **Map Unit Composition**

Carrizo, rarely flooded and similar soils: 65 percent  
Carrizo, occasionally flooded and similar soils: 25 percent  
Dissimilar minor components: 10 percent

#### **Description of Carrizo, Rarely Flooded Soil**

##### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

##### **Setting**

*Landform:* Inset fans  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* All aspects  
*Slope range:* 0 to 4 percent  
*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Creosote bush and burrobush

##### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

##### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* Rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.5 inches)

##### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Fans (R030XD015CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

##### **Typical Profile**

A—0 to 1 inch; gravelly loamy sand  
C1—1 to 5 inches; gravelly sand  
C2—5 to 59 inches; very gravelly sand

#### **Description of Carrizo, Occasionally Flooded Soil**

##### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Drainageways

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 0 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Catclaw acacia, Asian mustard, bladderpod spiderflower, creosote bush, and burrobrush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 3

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; very gravelly loamy sand

Bk—1 to 5 inches; very gravelly sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; extremely gravelly sand

**Minor Components**

**Oldale soils**

*Percent of map unit:* 9 percent

*Slope:* 0 to 2 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

**Carrizo, frequently flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 0 to 2 percent

*Landform:* Active channels

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

## **2406—Pintobasin-Carrizo association, 2 to 8 percent slopes, flooded**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,390 to 3,115 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Pintobasin, frequently flooded and similar soils: 50 percent  
Carrizo, occasionally flooded and similar soils: 40 percent  
Dissimilar minor components: 10 percent

### **Description of Pintobasin, Frequently Flooded Soil**

#### **Classification**

Mixed, hyperthermic Typic Torripsamments

#### **Setting**

*Landform:* Active channels  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* Northeast  
*Aspect range:* Northwest to east (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Catclaw acacia, smoketree, and burrobrush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* Frequent (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.4 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 3 inches; gravelly sand  
AC—3 to 19 inches; gravelly sand  
C—19 to 59 inches; gravelly sand

**Description of Carrizo, Occasionally Flooded Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Drainageways  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* Northeast  
*Aspect range:* Northwest to east (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Burrobrush, creosote bush, smooth desertdandelion, and catclaw acacia

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 3

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* Occasional (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; very gravelly loamy sand  
Bk—1 to 5 inches; very gravelly sand  
C1—5 to 13 inches; very gravelly sand  
C2—13 to 59 inches; extremely gravelly sand

**Minor Components**

**Pintobasin, rarely flooded soils**

*Percent of map unit:* 10 percent  
*Slope:* 2 to 8 percent  
*Landform:* Inset fans  
*Ecological site:* Hyperthermic Fans (R030XD015CA)

## **2407—Pintobasin-Carrizo association, 2 to 4 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 2,115 to 2,490 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Pintobasin, rarely flooded and similar soils: 45 percent  
Carrizo, occasionally flooded and similar soils: 30 percent  
Carrizo, frequently flooded and similar soils: 20 percent  
Dissimilar minor components: 5 percent

### **Description of Pintobasin, Rarely Flooded Soil**

#### **Classification**

Mixed, hyperthermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* Northwest to northeast (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Creosote bush, burrobush, and cryptantha

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* Rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Hyperthermic Fans (R030XD015CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 2 inches; gravelly sand



AC—2 to 4 inches; gravelly sand  
C1—4 to 24 inches; gravelly sand  
C2—24 to 59 inches; gravelly sand

### Description of Carrizo, Occasionally Flooded Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform*: Inset fans

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Tread

*Down-slope shape*: Linear

*Across-slope shape*: Concave

*Aspect (representative)*: North

*Aspect range*: Northwest to northeast (clockwise)

*Slope range*: 2 to 4 percent

*Parent material*: Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation*: Burrobrush, creosote bush, smooth desertdandelion, and catclaw acacia

#### Properties and Qualities

*Depth to restrictive feature*: None within a depth of 60 inches

*Shrink-swell potential*: Low (about 0.2 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: 3

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Excessively drained

*Flooding frequency*: Occasional (see table 24)

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Very low (about 2.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7s

*Ecological site*: Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

*Hydric soil status*: No

*Hydrologic soil group*: A

#### Typical Profile

A—0 to 1 inch; very gravelly loamy sand

Bk—1 to 5 inches; very gravelly sand

C1—5 to 13 inches; very gravelly sand

C2—13 to 59 inches; extremely gravelly sand

### Description of Carrizo, Frequently Flooded Soil

#### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### Setting

*Landform*: Channels

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Tread

*Down-slope shape*: Linear

*Across-slope shape*: Linear  
*Aspect (representative)*: North  
*Aspect range*: Northwest to northeast (clockwise)  
*Slope range*: 2 to 4 percent  
*Parent material*: Alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation*: Smoketree, burrobrush, annual forbs, hairy milkweed, and branched pencil cholla

#### **Properties and Qualities**

*Depth to restrictive feature*: None within a depth of 60 inches  
*Shrink-swell potential*: Low (about 0.2 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: 3

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ )*: High  
*Natural drainage class*: Excessively drained  
*Flooding frequency*: Frequent (see table 24)  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Very low (about 2.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 7s  
*Ecological site*: Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)  
*Hydric soil status*: No  
*Hydrologic soil group*: A

#### **Typical Profile**

A—0 to 1 inch; sand  
Bk—1 to 5 inches; very gravelly sand  
C1—5 to 13 inches; very gravelly sand  
C2—13 to 59 inches; extremely gravelly sand

#### **Minor Components**

##### **Aquapeak soils**

*Percent of map unit*: 5 percent  
*Slope*: 2 to 8 percent  
*Landform*: Fan remnants  
*Ecological site*: Desert Pavement (R030XY002CA)

## **2408—Rizzo complex, 2 to 8 percent slopes, flooded**

#### **Map Unit Setting**

*Landscape*: Fan piedmonts  
*Major land resource area*: 31—Lower Colorado Desert  
*Elevation*: 1,160 to 2,345 feet  
*Mean annual precipitation*: 2 to 4 inches  
*Mean annual air temperature*: 73 to 79 degrees F  
*Frost-free period*: 360 to 365 days

#### **Map Unit Composition**

Rizzo, frequently flooded and similar soils: 55 percent

Rizzo, very rarely flooded and similar soils: 35 percent  
Dissimilar minor components: 10 percent

### **Description of Rizzo, Frequently Flooded Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Channels

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from igneous rock

*Vegetation:* Burrobrush, desert ironwood, pygmy poppy, blue paloverde, distant phacelia, and desert lavender

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Frequent (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Large, High Intensity, Frequently Flooded Ephemeral Stream  
(R031XY026CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

C1—0 to 4 inches; gravelly coarse sand

C2—4 to 12 inches; very gravelly loamy coarse sand

C3—12 to 59 inches; very gravelly coarse sand

### **Description of Rizzo, Very Rarely Flooded Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Inset fans

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* East  
*Aspect range:* North to southeast (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from igneous rock  
*Vegetation:* Brittlebush, Schott's dalea, creosote bush, and wishbone-bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* Very rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Large, High Intensity, Frequently Flooded Ephemeral Stream  
(R031XY026CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; gravelly loamy coarse sand  
C1—2 to 9 inches; very gravelly loamy coarse sand  
C2—9 to 19 inches; very gravelly loamy coarse sand  
Ck—19 to 59 inches; very gravelly coarse sand

**Minor Components**

**Rizzo, strongly sloping soils**

*Percent of map unit:* 3 percent  
*Slope:* 8 to 15 percent  
*Landform:* Alluvial fans  
*Ecological site:* Limy Hill 4-6" p.z. (R031XY001CA)

**Rockhound, overwash soils**

*Percent of map unit:* 3 percent  
*Slope:* 0 to 4 percent  
*Landform:* Fan remnants  
*Ecological site:* Extremely Stony Fan Remnants (R031XY030CA)

**Deprave, overwash soils**

*Percent of map unit:* 2 percent  
*Slope:* 0 to 2 percent  
*Landform:* Fan remnants  
*Ecological site:* Extremely Stony Fan Remnants (R031XY030CA)

**Rizzo, gravelly surface soils**

*Percent of map unit:* 2 percent  
*Slope:* 2 to 8 percent  
*Landform:* Fan remnants  
*Ecological site:* Gravelly Fan Remnants And Fan Aprons (R031XY009CA)

## **2409—Rizzo-Chemwash-Carsitas complex, 4 to 8 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 1,030 to 2,655 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 81 degrees F

*Frost-free period:* 360 to 365 days

### **Map Unit Composition**

Rizzo, frequently flooded and similar soils: 35 percent

Chemwash, frequently flooded and similar soils: 30 percent

Carsitas, occasionally flooded, braided and similar soils: 25 percent

Dissimilar minor components: 10 percent

### **Description of Rizzo, Frequently Flooded Soil**

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Channels

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Burrobrush, desert ironwood, pygmy poppy, blue paloverde, distant phacelia, and desert lavender

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Frequent (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Large, High Intensity, Frequently Flooded Ephemeral Stream  
(R031XY026CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly loamy fine sand  
C1—1 to 4 inches; gravelly coarse sand  
C2—4 to 12 inches; very gravelly loamy coarse sand  
C3—12 to 59 inches; very gravelly coarse sand

**Description of Chemwash, Frequently Flooded Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Channels  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave  
*Aspect (representative):* South  
*Aspect range:* East to southwest (clockwise)  
*Slope range:* 4 to 8 percent  
*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss  
*Vegetation:* Smoketree and burrobrush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum based on representative value:* Nonsaline (about 1.0 mmho/cm)  
*Sodicity maximum:* Sodium adsorption ratio is about 1.0  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* Frequent (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Large, High Intensity, Frequently Flooded Ephemeral Stream  
(R031XY026CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; very gravelly coarse sand  
C—2 to 67 inches; stratified extremely gravelly coarse sand to very gravelly loamy coarse sand

**Description of Carsitas, Occasionally Flooded, Braided Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Braided drainageways  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Burrobrush and brittlebush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; gravelly loamy coarse sand

C—1 to 59 inches; gravelly sand

#### **Minor Components**

##### **Rizzo, extremely stony soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Extremely Stony Fan Remnants (R031XY030CA)

##### **Goldrose soils**

*Percent of map unit:* 4 percent

*Slope:* 2 to 8 percent

*Landform:* Fan aprons

*Ecological site:* Rarely Flooded Fans (R031XY200CA)

##### **Rock outcrop**

*Percent of map unit:* 1 percent

*Slope:* 2 to 50 percent

## **2420—Carsitas complex, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 900 to 1,735 feet



*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

#### **Map Unit Composition**

Carsitas, frequently flooded and similar soils: 45 percent

Carsitas, occasionally flooded and similar soils: 40 percent

Carsitas, rarely flooded and similar soils: 15 percent

#### **Description of Carsitas, Frequently Flooded Soil**

##### **Classification**

Mixed, hyperthermic Typic Torripsamments

##### **Setting**

*Landform:* Channels

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Desert willow, blue paloverde, Asian mustard, and smoketree

##### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

##### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Frequent (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

##### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Valley Wash (R031XY010CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

##### **Typical Profile**

A—0 to 1 inch; gravelly sand

C—1 to 59 inches; gravelly sand

#### **Description of Carsitas, Occasionally Flooded Soil**

##### **Classification**

Mixed, hyperthermic Typic Torripsamments

##### **Setting**

*Landform:* Drainageways

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Blue paloverde and Schott's dalea

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Valley Wash (R031XY010CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; gravelly sand

C—1 to 59 inches; gravelly sand

### **Description of Carsitas, Rarely Flooded Soil**

#### **Classification**

Mixed, hyperthermic Typic Torripsamments

#### **Setting**

*Landform:* Bars

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 0 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Brittlebush, catclaw acacia, creosote bush, and desert lavender

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.0 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Coarse Gravelly Wash (R031XY019CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 1 inch; sandy loam

C—1 to 59 inches; gravelly sand

## 2421—Carsitas complex, 4 to 8 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 1,475 to 2,620 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

### Map Unit Composition

Carsitas, very rarely flooded and similar soils: 55 percent

Carsitas, rarely flooded and similar soils: 25 percent

Dissimilar minor components: 20 percent

### Description of Carsitas, Very Rarely Flooded Soil

#### Classification

Mixed, hyperthermic Typic Torripsamments

#### Setting

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Summit and shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Creosote bush, burrobush, brittlebush, desert Indianwheat, and lupine

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Very rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Rarely Flooded Fans (R031XY200CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 1 inch; gravelly loamy sand

C—1 to 59 inches; gravelly sand

## Description of Carsitas, Rarely Flooded Soil

### Classification

Mixed, hyperthermic Typic Torripsamments

### Setting

*Landform:* Bars

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Brittlebush, Schott's dalea, and creosote bush

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.0 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 1 inch; sandy loam

C—1 to 59 inches; gravelly sand

### Minor Components

#### **Carsitas, occasionally flooded, braided soils**

*Percent of map unit:* 10 percent

*Slope:* 4 to 8 percent

*Landform:* Drainageways

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

#### **Rizzo, very rarely flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Alluvial fans

*Ecological site:* Rarely Flooded Fans (R031XY200CA)

#### **Chemwash, frequently flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 8 percent

*Landform:* Drainageways on inset fans

*Ecological site:* Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)

#### **Typic Haplargids, very rarely flooded**

*Percent of map unit:* 2 percent

*Slope:* 4 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Rarely Flooded Fans (R031XY200CA)

#### **Riverwash**

*Percent of map unit:* 1 percent

*Slope:* 2 to 15 percent

## **2431—Chemwash complex, 4 to 8 percent slopes**

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 1,800 to 3,245 feet

*Mean annual precipitation:* 2 to 5 inches

*Mean annual air temperature:* 63 to 79 degrees F

*Frost-free period:* 280 to 365 days

### Map Unit Composition

Chemwash, frequently flooded, braided and similar soils: 60 percent

Chemwash, frequently flooded and similar soils: 25 percent

Dissimilar minor components: 15 percent

### Description of Chemwash, Frequently Flooded, Braided Soil

#### **Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

#### **Setting**

*Landform:* Drainageways

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Linear

*Across-slope shape:* Concave

## Soil Survey of Joshua Tree National Park, California

*Aspect (representative):* Southeast

*Aspect range:* Northeast to southwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Burrobrush, desert lavender, and brittlebush

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum based on representative value:* Nonsaline (about 1.0 mmho/cm)

*Sodicity maximum:* Sodium adsorption ratio is about 1.0

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Frequent (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.7 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 2 inches; very gravelly coarse sand

C—2 to 67 inches; stratified extremely gravelly coarse sand to very gravelly loamy coarse sand

## Description of Chemwash, Frequently Flooded Soil

### Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

### Setting

*Landform:* Drainageways on upper alluvial fans

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* Southeast

*Aspect range:* Northeast to southwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss

*Vegetation:* Smoketree and burrobrush

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum based on representative value:* Nonsaline (about 1.0 mmho/cm)

*Sodicity maximum:* Sodium adsorption ratio is about 1.0

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Frequent (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Large, High Intensity, Frequently Flooded Ephemeral Stream  
(R031XY026CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; very gravelly coarse sand

C—2 to 67 inches; stratified extremely gravelly coarse sand to very gravelly loamy coarse sand

**Minor Components**

**Chemwash, rarely flooded soils**

*Percent of map unit:* 10 percent

*Slope:* 4 to 8 percent

*Landform:* Alluvial fans and terraces

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

**Cajon, occasionally flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Narrow drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Riverwash**

*Percent of map unit:* 2 percent

*Slope:* 2 to 50 percent

**2440—Rizzo complex, 8 to 15 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 31—Lower Colorado Desert

*Elevation:* 1,230 to 2,230 feet

*Mean annual precipitation:* 2 to 4 inches

*Mean annual air temperature:* 73 to 79 degrees F

*Frost-free period:* 360 to 365 days

**Map Unit Composition**

Rizzo and similar soils: 35 percent

Rizzo, occasionally flooded and similar soils: 30 percent

Rizzo, extremely stony and similar soils: 15 percent

Dissimilar minor components: 20 percent

**Description of Rizzo Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents



**Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Northeast

*Aspect range:* Northwest to southeast (clockwise)

*Slope range:* 8 to 15 percent

*Parent material:* Alluvium derived from igneous rock

*Vegetation:* Creosote bush, sowthistle desertdandelion, Schott's dalea, desert Indianwheat, and cushion foxtail cactus

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Gravelly Fan Remnants And Fan Aprons (R031XY009CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly loamy fine sand

C1—1 to 4 inches; gravelly coarse sand

C2—4 to 12 inches; very gravelly loamy coarse sand

C3—12 to 59 inches; very gravelly coarse sand

**Description of Rizzo, Occasionally Flooded Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Braided drainageways

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* Northeast

*Aspect range:* Northwest to southeast (clockwise)

*Slope range:* 8 to 15 percent

*Parent material:* Alluvium derived from igneous rock

*Vegetation:* Desert lavender, brittlebush, fiddleneck, sweetbush, and cryptantha

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; extremely gravelly coarse sand

C1—1 to 4 inches; gravelly coarse sand

C2—4 to 12 inches; very gravelly loamy coarse sand

C3—12 to 59 inches; very gravelly coarse sand

**Description of Rizzo, Extremely Stony Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* Northwest

*Aspect range:* Northwest to southeast (clockwise)

*Slope range:* 8 to 15 percent

*Parent material:* Alluvium derived from igneous rock

*Vegetation:* Creosote bush, teddybear cholla, California barrel cactus, and chia

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated): 7e*

*Ecological site:* Extremely Stony Fan Remnants (R031XY030CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; extremely cobbly sandy loam

C1—1 to 9 inches; very gravelly loamy coarse sand

C2—9 to 19 inches; very gravelly loamy coarse sand

Ck—19 to 59 inches; very gravelly coarse sand

**Minor Components**

**Rizzo, frequently flooded soils**

*Percent of map unit:* 10 percent

*Slope:* 8 to 15 percent

*Landform:* Narrow channels

*Ecological site:* Frequently Flooded, Confined Ephemeral Stream (R031XY029CA)

**Rizzo, steep soils**

*Percent of map unit:* 10 percent

*Slope:* 15 to 30 percent

*Landform:* Alluvial fans

*Ecological site:* Limy Hill 4-6" p.z. (R031XY001CA)

**2715—Dalelake-Sheephole-Pintobasin complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,145 to 2,230 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Dalelake and similar soils: 35 percent

Sheephole and similar soils: 30 percent

Pintobasin and similar soils: 25 percent

Dissimilar minor components: 10 percent

**Description of Dalelake Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Dunes and sand sheets

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear and convex

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 8 percent

## Soil Survey of Joshua Tree National Park, California

*Parent material:* Eolian sands derived from granitoid

*Vegetation:* Asian mustard, big galleta, creosote bush, and sowthistle desert dandelion

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.1 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 2 inches; fine sand

C—2 to 59 inches; fine sand

## Description of Sheephole Soil

### Classification

Sandy, mixed, hyperthermic Typic Torriorthents

### Setting

*Landform:* Sand sheets

*Landform position (two-dimensional):* Summit and backslope

*Landform position (three-dimensional):* Nose slope and tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Eolian deposits derived from granitoid over alluvium derived from granitoid

*Vegetation:* Asian mustard, Panamint cryptantha, Mediterranean grass, and creosote bush

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Hyperthermic Sandy Plains (R030XD014CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; fine sand  
Bw—1 to 6 inches; fine sand  
Bk1—6 to 22 inches; fine sand  
Bk2—22 to 29 inches; fine sand  
2Ckq—29 to 42 inches; extremely cobbly fine sand  
3C—42 to 59 inches; fine sand

**Description of Pintobasin Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* Northwest to northeast (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Alluvium and eolian sands derived from mixed sources  
*Vegetation:* Asian mustard, creosote bush, and cryptantha

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Dry Deep Sandy Fan Aprons (R030XD006CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; fine sand  
Bw—1 to 8 inches; fine sand

C1—8 to 24 inches; gravelly sand

C2—24 to 59 inches; gravelly sand

#### Minor Components

##### **Dalelake, strongly sloping soils**

*Percent of map unit:* 6 percent

*Slope:* 8 to 15 percent

*Landform:* Dunes

*Ecological site:* Hyperthermic Sandhill (R030XD008CA)

##### **Carrizo, frequently flooded soils**

*Percent of map unit:* 4 percent

*Slope:* 0 to 4 percent

*Landform:* Channels

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

## **2716—Dalelake complex, 4 to 30 percent slopes**

#### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,685 to 1,980 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

#### Map Unit Composition

Dalelake, steep and similar soils: 75 percent

Dalelake and similar soils: 20 percent

Dissimilar minor components: 5 percent

#### Description of Dalelake, Steep Soil

##### **Classification**

Mixed, hyperthermic Typic Torripsamments

##### **Setting**

*Landform:* Dunes

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* Northwest

*Aspect range:* West to north (clockwise)

*Slope range:* 8 to 30 percent

*Parent material:* Eolian sands derived from mixed sources

*Vegetation:* Big galleta, Asian mustard, and creosote bush

##### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Sandhill (R030XD008CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 4 inches; fine sand

C—4 to 59 inches; fine sand

**Description of Dalelake Soil****Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Sand sheets

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northwest

*Aspect range:* West to north (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Eolian sands derived from mixed sources

*Vegetation:* Creosote bush, Asian mustard, desert Indianwheat, Mediterranean grass, big galleta, cryptantha, pincushion flower, and dyebush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

*Hydric soil status:* No

*Hydrologic soil group:* A



**Typical Profile**

A—0 to 4 inches; fine sand

C—4 to 59 inches; fine sand

**Minor Components**

**Perurose soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

**2717—Dalelake-Rock outcrop-Buzzardsprings  
association, 4 to 30 percent slopes**

**Map Unit Setting**

*Landscape:* Basalt hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 950 to 1,540 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Dalelake and similar soils: 40 percent

Rock outcrop: 25 percent

Buzzardsprings, fine sand and similar soils: 20 percent

Dissimilar minor components: 15 percent

**Description of Dalelake Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Sand sheets on lava flows

*Landform position (two-dimensional):* Summit and footslope

*Landform position (three-dimensional):* Head slope and tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear and concave

*Aspect (representative):* North

*Aspect range:* Northwest to north (clockwise)

*Slope range:* 8 to 30 percent

*Parent material:* Eolian deposits derived from igneous rock

*Vegetation:* Big galleta, Asian mustard, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Hyperthermic Sandhill (R030XD008CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 4 inches; fine sand  
C—4 to 59 inches; fine sand

**Description of Rock Outcrop**

**Setting**

*Landform:* Hills  
*Aspect:* All aspects  
*Slope range:* 2 to 100 percent  
*Definition:* Areas of exposed basalt without a soil mantle

**Description of Buzzardsprings, Fine Sand Soil**

**Classification**

Sandy, mixed, hyperthermic Typic Haplocalcids

**Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave  
*Aspect (representative):* North  
*Aspect range:* Northwest to north (clockwise)  
*Slope range:* 4 to 30 percent  
*Parent material:* Alluvium derived from igneous rock  
*Vegetation:* Creosote bush, burrobush, cryptantha, and smooth desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.5 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 8

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants  
(R030XD042CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; loamy fine sand

Bk1—2 to 3 inches; fine sand

Bk2—3 to 8 inches; loamy fine sand

2Bk—8 to 23 inches; sand

2Ck—23 to 60 inches; gravelly sand

**Minor Components**

**Missionwell soils**

*Percent of map unit:* 9 percent

*Slope:* 8 to 15 percent

*Landform:* Basalt lava flows

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

**Dalelake, moderately sloping soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 8 percent

*Landform:* Sand sheets

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

**Impedimenta soils**

*Percent of map unit:* 1 percent

*Slope:* 8 to 30 percent

*Landform:* Hills

*Ecological site:* Hyperthermic Dissected Shallow Pediment (R030XD023CA)

**2718—Dalelake-Sheephole complex, 2 to 4 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 705 to 900 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Dalelake and similar soils: 55 percent

Sheephole, gravelly surface and similar soils: 45 percent

**Description of Dalelake Soil**

**Classification**

Mixed, hyperthermic Typic Torripsamments

**Setting**

*Landform:* Sand sheets

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* South  
*Aspect range:* Southeast to southwest (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Eolian deposits derived from igneous rock  
*Vegetation:* Cryptantha, desert Indianwheat, and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 4 inches; fine sand  
C—4 to 59 inches; fine sand

**Description of Sheephole, Gravelly Surface Soil**

**Classification**

Sandy, mixed, hyperthermic Typic Torriorthents

**Setting**

*Landform:* Sand sheets on fan aprons  
*Landform position (two-dimensional):* Backslope and toeslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Aspect (representative):* South  
*Aspect range:* Southeast to southwest (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Eolian deposits derived from igneous rock over alluvium derived from igneous rock  
*Vegetation:* Creosote bush, cryptantha, dyebush, and sowthistle desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.5 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 1 inch; fine sand

Bw—1 to 6 inches; fine sand

Bk1—6 to 22 inches; fine sand

Bk2—22 to 29 inches; fine sand

2Ckq—29 to 42 inches; very gravelly sand

3C—42 to 59 inches; fine sand

## 2820—Rock outcrop-Impedimenta complex, 4 to 30 percent slopes

### Map Unit Setting

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,655 to 2,755 feet

*Mean annual precipitation:* 2 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 365 days

### Map Unit Composition

Rock outcrop: 60 percent

Impedimenta and similar soils: 25 percent

Dissimilar minor components: 15 percent

### Description of Rock Outcrop

#### Setting

*Landform:* Mountain slopes

*Aspect:* All aspects

*Slope range:* 8 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

### Description of Impedimenta Soil

#### Classification

Mixed, hyperthermic Lithic Torripsamments

#### Setting

*Landform:* Pediments

*Landform position (two-dimensional):* Summit and shoulder

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Aspect (representative):* Northeast  
*Aspect range:* Northwest to east (clockwise)  
*Slope range:* 4 to 30 percent  
*Parent material:* Residuum weathered from granitoid  
*Vegetation:* Mojave indigobush, desert Indianwheat, Asian mustard, desertsenna, littleleaf ratany, and pincushion flower

**Properties and Qualities**

*Depth to restrictive feature:* 1 to 7 inches to lithic bedrock  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 0.2 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Hyperthermic Dissected Shallow Pediment (R030XD023CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; gravelly loamy sand  
C—1 to 4 inches; gravelly sand  
R—4 to 14 inches; bedrock

**Minor Components**

**Marbolite soils**

*Percent of map unit:* 10 percent  
*Slope:* 2 to 8 percent  
*Landform:* Pediments  
*Ecological site:* Hyperthermic Dissected Shallow Pediment (R030XD023CA)

**Pintobasin, occasionally flooded, narrow soils**

*Percent of map unit:* 4 percent  
*Slope:* 2 to 4 percent  
*Landform:* Drainageways  
*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)

**Perurose soils**

*Percent of map unit:* 1 percent  
*Slope:* 2 to 8 percent  
*Landform:* Eroded fan remnants  
*Ecological site:* Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)

## **2825—Rock outcrop-Supplymine-Bolero-Ironage complex, 15 to 60 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 30—Mojave Desert  
*Elevation:* 1,145 to 2,785 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 68 to 73 degrees F  
*Frost-free period:* 300 to 340 days

### **Map Unit Composition**

Rock outcrop: 35 percent  
Supplymine and similar soils: 25 percent  
Bolero, dry and similar soils: 15 percent  
Ironage and similar soils: 15 percent  
Dissimilar minor components: 10 percent

### **Description of Rock Outcrop**

#### **Setting**

*Landform:* Mountains  
*Aspect:* All aspects  
*Slope range:* 8 to 100 percent  
*Definition:* Areas of exposed gneiss without a soil mantle

### **Description of Supplymine Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocalcids

#### **Setting**

*Landform:* North-facing mountains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Mountain flank  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Aspect (representative):* North  
*Aspect range:* Northwest to west (clockwise)  
*Slope range:* 30 to 60 percent  
*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss  
*Vegetation:* Creosote bush, desert Indianwheat, pincushion flower, curvenut combseed, and sowthistle desertdandelion

#### **Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to lithic bedrock  
*Shrink-swell potential:* Low (about 0.6 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 17

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 2.1 inches)



**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

C—0 to 6 inches; cobbles

A—6 to 7 inches; very cobbly loamy fine sand

Bk1—7 to 20 inches; very cobbly fine sandy loam

Bk2—20 to 33 inches; very cobbly fine sandy loam

Rk—33 to 43 inches; bedrock

**Description of Bolero, Dry Soil**

**Classification**

Sandy-skeletal, mixed, hyperthermic Lithic Torriorthents

**Setting**

*Landform:* Mountains and hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank and side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northeast

*Aspect range:* Northwest to west (clockwise)

*Slope range:* 15 to 60 percent

*Parent material:* Colluvium derived from gneiss and/or residuum weathered from gneiss

*Vegetation:* Creosote bush, desert Indianwheat, pincushion flower, curvenut combseed, and sowthistle desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.5 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

C—0 to 6 inches; cobbles

A—6 to 7 inches; extremely gravelly loamy fine sand

Bw—7 to 12 inches; very gravelly loamy fine sand

Bk—12 to 15 inches; very gravelly loamy fine sand

Ck—15 to 19 inches; gravel  
R—19 to 29 inches; bedrock

### Description of Ironage Soil

#### Classification

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Calciargids

#### Setting

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* Northwest to west (clockwise)

*Slope range:* 15 to 60 percent

*Parent material:* Residuum weathered from gneiss

*Vegetation:* Creosote bush, desert Indianwheat, pincushion flower, curvenut  
combseed, and sowthistle desertdandelion

#### Properties and Qualities

*Depth to restrictive feature:* 20 to 39 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 19

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.2 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### Typical Profile

C—0 to 6 inches; cobbles

A—6 to 9 inches; very gravelly fine sandy loam

Bkq—9 to 13 inches; very gravelly fine sandy loam

Btkq1—13 to 18 inches; extremely gravelly fine sandy loam

Btkq2—18 to 24 inches; extremely gravelly sandy loam

R—24 to 33 inches; bedrock

### Minor Components

#### Blackeagle soils

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Mountains and hills

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

**Dalelake soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 30 percent

*Landform:* Sand sheets

*Ecological site:* Hyperthermic Sandsheets (R030XD025CA)

**2830—Rock outcrop-Blackeagle complex, 30 to 75 percent slopes, dry**

**Map Unit Setting**

*Major land resource area:* 30—Mojave Desert

*Elevation:* 520 to 3,985 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 68 to 73 degrees F

*Frost-free period:* 300 to 340 days

**Map Unit Composition**

Rock outcrop: 80 percent

Blackeagle, cool and similar soils: 10 percent

Dissimilar minor components: 10 percent

**Description of Rock Outcrop**

**Setting**

*Landform:* Mountain slopes

*Aspect:* All aspects

*Slope range:* 15 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

**Description of Blackeagle, Cool Soil**

**Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplocambids

**Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank and side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear and concave

*Aspect (representative):* Southeast

*Aspect range:* Northwest to west (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium over residuum derived from granitoid

*Vegetation:* Creosote bush, desert Indianwheat, pincushion flower, curvenut combseed, and sowthistle desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.5 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

C—0 to 8 inches; stones

A—8 to 9 inches; very gravelly sandy loam

Bw—9 to 16 inches; very gravelly sandy loam

R—16 to 30 inches; bedrock

### Minor Components

#### Marbolite soils

*Percent of map unit:* 4 percent

*Slope:* 50 to 75 percent

*Landform:* Mountains

*Ecological site:* Low-Production Hyperthermic Hills (R030XD004CA)

#### Blackeagle soils

*Percent of map unit:* 3 percent

*Slope:* 50 to 75 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

#### Impedimenta soils

*Percent of map unit:* 2 percent

*Slope:* 30 to 75 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

#### Supplymine soils

*Percent of map unit:* 1 percent

*Slope:* 30 to 50 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

## 2835—Rock outcrop-Blackeagle complex, 30 to 75 percent slopes

### Map Unit Setting

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,115 to 3,965 feet

*Mean annual precipitation:* 2 to 7 inches

*Mean annual air temperature:* 63 to 79 degrees F

*Frost-free period:* 270 to 365 days

### Map Unit Composition

Rock outcrop: 40 percent  
Blackeagle and similar soils: 40 percent  
Dissimilar minor components: 20 percent

### Description of Rock Outcrop

#### Setting

*Landform:* Mountains  
*Aspect:* All aspects  
*Slope range:* 8 to 100 percent  
*Definition:* Areas of exposed basalt without a soil mantle

### Description of Blackeagle Soil

#### Classification

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplocambids

#### Setting

*Landform:* Mountains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Lower third of mountain flank  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* East  
*Aspect range:* West to southwest (clockwise)  
*Slope range:* 30 to 75 percent  
*Parent material:* Colluvium over residuum derived from granitoid  
*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

#### Properties and Qualities

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock  
*Shrink-swell potential:* Low (about 0.7 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.0 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 8  
*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

#### Typical Profile

C—0 to 5 inches; gravel  
A—5 to 7 inches; very gravelly fine sandy loam  
Bk—7 to 17 inches; very gravelly fine sandy loam  
R—17 to 27 inches; bedrock

### Minor Components

#### **Supplymine soils**

*Percent of map unit:* 10 percent

*Slope:* 30 to 75 percent

*Landform:* Mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

#### **Rizzo, extremely stony soils**

*Percent of map unit:* 4 percent

*Slope:* 8 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Extremely Stony Fan Remnants (R031XY030CA)

#### **Aguilareal soils**

*Percent of map unit:* 3 percent

*Slope:* 30 to 60 percent

*Landform:* High-elevation side slopes of mountains

*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

#### **Rubble land**

*Percent of map unit:* 2 percent

#### **Rizzo, frequently flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 8 to 30 percent

*Landform:* Braided channels

*Ecological site:* Gravelly, Braided, Ephemeral Stream (R031XY034CA)

## **2840—Rock outcrop-Jadestorm complex, 30 to 60 percent slopes**

### Map Unit Setting

*Major land resource area:* 30—Mojave Desert

*Elevation:* 1,230 to 3,700 feet

*Mean annual precipitation:* 2 to 5 inches

*Mean annual air temperature:* 68 to 79 degrees F

*Frost-free period:* 300 to 365 days

### Map Unit Composition

Rock outcrop: 65 percent

Jadestorm and similar soils: 30 percent

Dissimilar minor components: 5 percent

### Description of Rock Outcrop

#### **Setting**

*Landform:* Mountain slopes

*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granitoid rocks and/or gneiss without a soil mantle

### Description of Jadestorm Soil

#### **Classification**

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic, shallow Typic Torriorthents

### **Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southeast

*Aspect range:* North to southwest (clockwise)

*Slope range:* 30 to 60 percent

*Parent material:* Colluvium derived from granitoid and/or gneiss over residuum weathered from granitoid and/or gneiss

*Vegetation:* Creosote bush and brittlebush

### **Properties and Qualities**

*Depth to restrictive feature:* 4 to 14 inches to paralithic bedrock; 6 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.5 inch)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### **Typical Profile**

C—0 to 2 inches; gravel

A—2 to 3 inches; very gravelly sandy loam

Bw—3 to 10 inches; very gravelly sandy loam

Cr—10 to 17 inches; bedrock

R—17 to 27 inches; bedrock

### **Minor Components**

#### **Rizzo, extremely stony soils**

*Percent of map unit:* 3 percent

*Slope:* 15 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Extremely Stony Fan Remnants (R031XY030CA)

#### **Carrizo, frequently flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 8 percent

*Landform:* Braided channels

*Ecological site:* Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)



## **3110—Coppermine-Stranger complex, 8 to 50 percent slopes**

### **Map Unit Setting**

*Landscape:* Hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,735 to 3,330 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 63 to 73 degrees F

*Frost-free period:* 270 to 340 days

### **Map Unit Composition**

Coppermine, cool and similar soils: 40 percent

Stranger and similar soils: 30 percent

Dissimilar minor components: 30 percent

### **Description of Coppermine, Cool Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, thermic Lithic Haplargids

#### **Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* North to southwest (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from granitoid and/or residuum weathered from granitoid

*Vegetation:* Big galleta, jojoba, Mojave yucca, pincushion flower, Eastern Mojave buckwheat, desert globemallow, Mojave woodyaster, and Parry's wirelettuce

#### **Properties and Qualities**

*Depth to restrictive feature:* 5 to 14 inches to lithic bedrock

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.8 inch)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

A1—0 to 1 inch; sandy loam  
A2—1 to 4 inches; gravelly sandy loam  
Bt1—4 to 8 inches; very gravelly sandy loam  
Bt2—8 to 11 inches; extremely gravelly sandy clay loam  
R—11 to 21 inches; bedrock

### Description of Stranger Soil

#### Classification

Mixed, thermic Lithic Torripsamments

#### Setting

*Landform:* Pediments

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Nose slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* North to southwest (clockwise)

*Slope range:* 8 to 50 percent

*Parent material:* Residuum weathered from granitoid

*Vegetation:* Pincushion flower, Hall's shrubby-spurge, Mojave yucca, Eastern Mojave buckwheat, and jojoba

#### Properties and Qualities

*Depth to restrictive feature:* 3 to 10 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.2 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Warm Sloping Pediments (R030XB225CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

A—0 to 1 inch; gravelly loamy fine sand  
C—1 to 3 inches; sand  
R—3 to 13 inches; bedrock

### Minor Components

#### Supplymine soils

*Percent of map unit:* 10 percent

*Slope:* 15 to 60 percent

*Landform:* South-facing side slopes of hillsides

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

**Rock outcrop**

*Percent of map unit:* 7 percent

*Slope:* 2 to 100 percent

**Typic Petrocalcids**

*Percent of map unit:* 7 percent

*Slope:* 8 to 30 percent

*Landform:* Hills

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

**Grubstake soils**

*Percent of map unit:* 5 percent

*Slope:* 15 to 50 percent

*Landform:* North-facing hills

*Ecological site:* Warm Shallow Pediments (R030XB228CA)

**Stranger, frequently flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 8 percent

*Landform:* Channels on pediments

*Ecological site:* Warm Sloping Pediments (R030XB225CA)

**3120—Aguilareal-Blackeagle-Rock outcrop complex, 30 to 60 percent slopes**

**Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,755 to 5,340 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 55 to 73 degrees F

*Frost-free period:* 210 to 340 days

**Map Unit Composition**

Aguilareal and similar soils: 40 percent

Blackeagle and similar soils: 20 percent

Rock outcrop: 15 percent

Dissimilar minor components: 25 percent

**Description of Aguilareal Soil**

**Classification**

Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids

**Setting**

*Landform:* Side slopes of mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* West to east (clockwise)

*Slope range:* 30 to 60 percent

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Vegetation:* Parish's goldeneye, creosote bush, Eastern Mojave buckwheat, Nevada jointfir, and redstem stork's bill

#### **Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 1.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

C—0 to 3 inches; stones

A—3 to 4 inches; extremely cobbly loamy sand

Bk1—4 to 14 inches; very gravelly sandy loam

Bk2—14 to 19 inches; very gravelly sandy loam

Rk—19 to 29 inches; bedrock

### **Description of Blackeagle Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplocambids

#### **Setting**

*Landform:* South-facing, low-elevation side slopes of mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Center third of mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* Southwest to north (clockwise)

*Slope range:* 30 to 60 percent

*Parent material:* Colluvium over residuum derived from granitoid

*Vegetation:* Brittlebush, creosote bush, pincushion flower, and California fagonbush

#### **Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.0 inch)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

C—0 to 5 inches; gravel

A—5 to 7 inches; very gravelly fine sandy loam

Bk—7 to 17 inches; very gravelly fine sandy loam

R—17 to 27 inches; bedrock

#### **Description of Rock Outcrop**

##### **Setting**

*Landform:* Mountains

*Aspect:* All aspects

*Slope range:* 8 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

#### **Minor Components**

##### **Bigbernie, warm soils**

*Percent of map unit:* 10 percent

*Slope:* 30 to 75 percent

*Landform:* Northwest-facing, low-elevation side slopes of mountains

*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

##### **Contactmine soils**

*Percent of map unit:* 5 percent

*Slope:* 30 to 60 percent

*Landform:* Upper backslopes of mountains

*Ecological site:* Shallow Cool Hills (R030XB189CA)

##### **Pinecity, cool soils**

*Percent of map unit:* 5 percent

*Slope:* 30 to 60 percent

*Landform:* Hills

*Ecological site:* Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)

##### **Lithic Haplocalcids**

*Percent of map unit:* 3 percent

*Slope:* 15 to 30 percent

*Landform:* Narrow summits of mountains

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

##### **Typic Haplargids**

*Percent of map unit:* 2 percent

*Slope:* 15 to 50 percent

*Landform:* Shoulders of mountains

*Ecological site:* Shallow Cool Hills (R030XB189CA)

## **3213—Dalvord-Aguilareal-Rock outcrop complex, 15 to 60 percent slopes**

### **Map Unit Setting**

*Landscape:* Hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,845 to 3,755 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

### **Map Unit Composition**

Dalvord and similar soils: 35 percent

Aguilareal and similar soils: 30 percent

Rock outcrop: 25 percent

Dissimilar minor components: 10 percent

### **Description of Dalvord Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Torriorthents

#### **Setting**

*Landform:* Side slopes of hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 15 to 60 percent

*Parent material:* Colluvium derived from gneiss and/or residuum weathered from gneiss

*Vegetation:* Creosote bush, redstem stork's bill, and bristly fiddleneck

#### **Properties and Qualities**

*Depth to restrictive feature:* 3 to 14 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 2

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.6 inch)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 3-5" P.Z. (R030XB139CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

C—0 to 2 inches; gravel  
A—2 to 3 inches; gravelly loamy fine sand  
Bk1—3 to 5 inches; fine sandy loam  
Bk2—5 to 14 inches; extremely gravelly sandy loam  
Rk—14 to 24 inches; bedrock

### Description of Aguilareal Soil

#### Classification

Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids

#### Setting

*Landform*: Side slopes of hills  
*Landform position (two-dimensional)*: Backslope  
*Landform position (three-dimensional)*: Side slope  
*Down-slope shape*: Convex  
*Across-slope shape*: Linear  
*Aspect (representative)*: Northeast  
*Aspect range*: Northwest to east (clockwise)  
*Slope range*: 30 to 60 percent  
*Parent material*: Colluvium derived from granite over residuum weathered from granite  
*Vegetation*: Hall's shrubby-spurge, redstem stork's bill, burrobush, desert trumpet, brittlebush, and creosote bush

#### Properties and Qualities

*Depth to restrictive feature*: 14 to 20 inches to lithic bedrock  
*Shrink-swell potential*: Low (about 0.8 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High  
*Natural drainage class*: Somewhat excessively drained  
*Flooding frequency*: None  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Very low (about 1.1 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 8  
*Ecological site*: Warm Gravelly Shallow Hills (R030XB172CA)  
*Hydric soil status*: No  
*Hydrologic soil group*: D

### Typical Profile

C—0 to 3 inches; stones  
A—3 to 5 inches; gravelly loamy sand  
Bk1—5 to 14 inches; very gravelly sandy loam  
Bk2—14 to 19 inches; very gravelly sandy loam  
Rk—19 to 29 inches; bedrock

### Description of Rock Outcrop

#### Setting

*Landform*: Hills  
*Aspect*: All aspects



*Slope range:* 4 to 100 percent

*Definition:* Areas of exposed granite and/or gneiss without a soil mantle

#### **Minor Components**

##### **Dalvord, bouldery soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 30 percent

*Landform:* Pediments

*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

##### **Langwell soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 30 percent

*Landform:* Pediments

*Ecological site:* Warm Sloping Pediments (R030XB225CA)

## **3242—Langwell-Rock outcrop-Helendale complex, 4 to 30 percent slopes**

#### **Map Unit Setting**

*Landscape:* Upper fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,195 to 4,000 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 270 to 320 days

#### **Map Unit Composition**

Langwell and similar soils: 50 percent

Rock outcrop: 25 percent

Helendale, cool and similar soils: 20 percent

Dissimilar minor components: 5 percent

#### **Description of Langwell Soil**

##### **Classification**

Loamy, mixed, superactive, calcareous, thermic Lithic Torriorthents

##### **Setting**

*Landform:* Pediments

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* West

*Aspect range:* South to northwest (clockwise)

*Slope range:* 4 to 30 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Burrobush, redstem stork's bill, Hall's shrubby-spurge, Nevada jointfir, Parish's goldeneye, cottontop cactus, and Mojave woodyaster

##### **Properties and Qualities**

*Depth to restrictive feature:* 4 to 14 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Warm Sloping Pediments (R030XB225CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; gravelly sandy loam

Bw—1 to 4 inches; gravelly sandy loam

R—4 to 14 inches; bedrock

**Description of Rock Outcrop**

**Setting**

*Landform:* Pediments

*Aspect:* All aspects

*Slope range:* 4 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

**Description of Helendale, Cool Soil**

**Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

**Setting**

*Landform:* Fan aprons on fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* West

*Aspect range:* South to northwest (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Bristly fiddleneck, red brome, burrobush, chia, and redstem stork's bill

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Moderate (about 6.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Moderately Deep To Very Deep Loamy Fan Remnants  
(R030XB218CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 10 inches; loamy sand

Bt1—10 to 37 inches; sandy loam

Bt2—37 to 59 inches; sandy loam

**Minor Components**

**Arizo, rarely flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 8 percent

*Landform:* Inset fans

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**3285—Pinecity-Contactmine-Desertqueen-Rock outcrop  
association, 30 to 50 percent slopes**

**Map Unit Setting**

*Landscape:* Hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,360 to 5,000 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

**Map Unit Composition**

Pinecity and similar soils: 30 percent

Contactmine and similar soils: 20 percent

Desertqueen and similar soils: 20 percent

Rock outcrop: 15 percent

Dissimilar minor components: 15 percent

**Description of Pinecity Soil**

**Classification**

Mixed, thermic, shallow Typic Torripsamments

**Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* North to southwest (clockwise)

## Soil Survey of Joshua Tree National Park, California

*Slope range:* 30 to 50 percent

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Vegetation:* Parish's goldeneye, blackbrush, Virgin River brittlebush, redstem stork's bill, and desert needlegrass

### Properties and Qualities

*Depth to restrictive feature:* 2 to 7 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Shallow Cool Hills (R030XB189CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

A—0 to 1 inch; gravelly loamy sand

Bw—1 to 7 inches; gravelly loamy sand

Cr—7 to 59 inches; bedrock

## Description of Contactmine Soil

### Classification

Fine-loamy, mixed, superactive, thermic Typic Haplargids

### Setting

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southwest (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Vegetation:* Mojave yucca, blackbrush, needle grama, and Nevada jointfir

### Properties and Qualities

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 2.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.2 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Shallow Cool Hills (R030XB189CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

**Typical Profile**

A1—0 to 1 inch; sandy loam

A2—1 to 5 inches; sandy loam

Bt—5 to 9 inches; gravelly sandy clay loam

Btk1—9 to 22 inches; cobbly loam

Btk2—22 to 26 inches; extremely gravelly loam

Crt—26 to 59 inches; bedrock

**Description of Desertqueen Soil**

**Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplargids

**Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southwest (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Vegetation:* Blackbrush, Parish's goldeneye, California juniper, and Eastern Mojave buckwheat

**Properties and Qualities**

*Depth to restrictive feature:* 11 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.9 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Shallow Cool Hills (R030XB189CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 4 inches; sandy loam

Bt—4 to 11 inches; gravelly sandy loam

Crt—11 to 59 inches; bedrock

#### Description of Rock Outcrop

##### Setting

*Landform:* Hills

*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granitoid rocks and/or gneiss without a soil mantle

#### Minor Components

##### Littlefargo soils

*Percent of map unit:* 8 percent

*Slope:* 4 to 15 percent

*Landform:* Mountains

*Ecological site:* Shallow Cool Hills (R030XB189CA)

##### Pinecity, low sloping soils

*Percent of map unit:* 5 percent

*Slope:* 4 to 15 percent

*Landform:* Hills

*Ecological site:* Shallow Cool Hills (R030XB189CA)

##### Pinecity, cool soils

*Percent of map unit:* 2 percent

*Slope:* 15 to 50 percent

*Landform:* Hills

*Ecological site:* Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)

## 3286—Pinecity gravelly loamy sand, 30 to 60 percent slopes

#### Map Unit Setting

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,805 to 5,705 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 270 days

#### Map Unit Composition

Pinecity, gravelly loamy sand and similar soils: 85 percent

Dissimilar minor components: 15 percent

#### Description of Pinecity, Gravelly Loamy Sand Soil

##### Classification

Mixed, thermic, shallow Typic Torripsamments

##### Setting

*Landform:* Hills and mountains

*Landform position (two-dimensional):* Shoulder and backslope

*Landform position (three-dimensional):* Mountain flank and side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Southwest to east (clockwise)

*Slope range:* 30 to 60 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Red brome, narrowleaf goldenbush, blackbrush, Mexican bladdersage, desert globemallow, and California juniper

#### **Properties and Qualities**

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.2 inch)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Shallow Cool Hills (R030XB189CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

A1—0 to 2 inches; gravelly loamy sand

A2—2 to 4 inches; gravelly loamy sand

Cr—4 to 59 inches; bedrock

### **Minor Components**

#### **Rock outcrop**

*Percent of map unit:* 7 percent

*Slope:* 4 to 100 percent

#### **Desertqueen soils**

*Percent of map unit:* 6 percent

*Slope:* 4 to 30 percent

*Landform:* Hills

*Ecological site:* Shallow Cool Hills (R030XB189CA)

#### **Pinecity, steep, high elevation soils**

*Percent of map unit:* 2 percent

*Slope:* 60 to 75 percent

*Landform:* Steep upper side slopes of mountains

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

## **3291—Smithcanyon-Stubbespring-Rock outcrop complex, 15 to 50 percent slopes**

### **Map Unit Setting**

*Landscape:* Hills

*Major land resource area:* 30—Mojave Desert



## Soil Survey of Joshua Tree National Park, California

*Elevation:* 3,940 to 5,575 feet  
*Mean annual precipitation:* 4 to 10 inches  
*Mean annual air temperature:* 55 to 68 degrees F  
*Frost-free period:* 210 to 320 days

### Map Unit Composition

Smithcanyon and similar soils: 40 percent  
Stubbespring and similar soils: 25 percent  
Rock outcrop: 20 percent  
Dissimilar minor components: 15 percent

### Description of Smithcanyon Soil

#### Classification

Mixed, thermic, shallow Xeric Torripsamments

#### Setting

*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* Southeast to northeast (clockwise)  
*Slope range:* 15 to 50 percent  
*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid  
*Vegetation:* Singleleaf pinyon, blackbrush, and Muller oak

#### Properties and Qualities

*Depth to restrictive feature:* 3 to 14 inches to paralithic bedrock  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 0.3 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

#### Typical Profile

A—0 to 3 inches; gravelly loamy fine sand  
Cr—3 to 59 inches; bedrock

### Description of Stubbespring Soil

#### Classification

Loamy, mixed, superactive, thermic, shallow Xeric Haplargids

**Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Southeast to northeast (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Blackbrush, Muller oak, and Eastern Mojave buckwheat

**Properties and Qualities**

*Depth to restrictive feature:* 7 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 1.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; coarse sand

Bw—1 to 4 inches; sand

Bt—4 to 13 inches; gravelly sandy loam

Crt—13 to 59 inches; bedrock

**Description of Rock Outcrop**

**Setting**

*Landform:* Hills

*Aspect:* All aspects

*Slope range:* 4 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

**Minor Components**

**Smithcanyon, moderately sloping soils**

*Percent of map unit:* 8 percent

*Slope:* 4 to 15 percent

*Landform:* Hills

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

**Contactmine soils**

*Percent of map unit:* 5 percent

*Slope:* 15 to 50 percent

*Landform:* Hills

*Ecological site:* Shallow Cool Hills (R030XB189CA)

**Pinecity soils**

*Percent of map unit:* 2 percent

*Slope:* 15 to 50 percent

*Landform:* Hills

*Ecological site:* Shallow Cool Hills (R030XB189CA)

**3292—Smithcanyon-Pinecity-Rock outcrop association,  
15 to 50 percent slopes**

**Map Unit Setting**

*Landscape:* Hills and mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,540 to 4,920 feet

*Mean annual precipitation:* 4 to 10 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

**Map Unit Composition**

Smithcanyon and similar soils: 35 percent

Pinecity and similar soils: 25 percent

Rock outcrop: 25 percent

Dissimilar minor components: 15 percent

**Description of Smithcanyon Soil**

**Classification**

Mixed, thermic, shallow Xeric Torripsamments

**Setting**

*Landform:* North-facing hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northwest

*Aspect range:* Southwest to east (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Singleleaf pinyon, blackbrush, and Muller oak

**Properties and Qualities**

*Depth to restrictive feature:* 3 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 2 inches; gravelly loamy sand

C—2 to 7 inches; gravelly loamy sand

Cr—7 to 59 inches; bedrock

**Description of Pinecity Soil**

**Classification**

Mixed, thermic, shallow Typic Torripsamments

**Setting**

*Landform:* South-facing hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Red brome, narrowleaf goldenbush, blackbrush, Mexican bladdersage, desert globemallow, and California juniper

**Properties and Qualities**

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Shallow Cool Hills (R030XB189CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A1—0 to 2 inches; gravelly loamy sand

A2—2 to 7 inches; gravelly loamy sand

Cr—7 to 59 inches; bedrock

### Description of Rock Outcrop

#### Setting

*Landform:* Hills

*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granitoid rocks and/or gneiss without a soil mantle

### Minor Components

#### Lostpalms soils

*Percent of map unit:* 5 percent

*Slope:* 30 to 75 percent

*Landform:* Hills

*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

#### Thunderclap, rarely flooded soils

*Percent of map unit:* 4 percent

*Slope:* 2 to 8 percent

*Landform:* Channels

*Ecological site:* Very Rarely To Rarely Flooded Thermic Ephemeral Stream  
(R030XY202CA)

#### Pinecity, very steep soils

*Percent of map unit:* 2 percent

*Slope:* 50 to 75 percent

*Landform:* Hills

*Ecological site:* Shallow Cool Hills (R030XB189CA)

#### Smithcanyon, strongly sloping soils

*Percent of map unit:* 2 percent

*Slope:* 8 to 15 percent

*Landform:* Low hills

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

#### Smithcanyon, very steep soils

*Percent of map unit:* 2 percent

*Slope:* 50 to 75 percent

*Landform:* Hills

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

## 3293—Smithcanyon-Pinecity association, 15 to 50 percent slopes

### Map Unit Setting

*Landscape:* Mountains and hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,605 to 5,740 feet

*Mean annual precipitation:* 4 to 10 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 270 days

### Map Unit Composition

Smithcanyon and similar soils: 50 percent

Pinecity and similar soils: 25 percent

Dissimilar minor components: 25 percent

### Description of Smithcanyon Soil

#### Classification

Mixed, thermic, shallow Xeric Torripsamments

#### Setting

*Landform*: North-facing hills, at elevations below 1,585 meters

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Side slope

*Down-slope shape*: Linear

*Across-slope shape*: Linear

*Aspect (representative)*: Northwest

*Aspect range*: Southwest to east (clockwise)

*Slope range*: 15 to 50 percent

*Parent material*: Colluvium derived from granitoid and/or colluvium derived from gneiss  
over residuum weathered from gneiss and/or residuum weathered from granitoid

*Vegetation*: Singleleaf pinyon, bigberry manzanita, and Muller oak

#### Properties and Qualities

*Depth to restrictive feature*: 3 to 14 inches to paralithic bedrock

*Shrink-swell potential*: Low (about 0.2 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Somewhat excessively drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Very low (about 0.4 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7e

*Ecological site*: Sandy Xeric-Intergrade Slopes (R030XE196CA)

*Hydric soil status*: No

*Hydrologic soil group*: D

#### Typical Profile

A—0 to 1 inch; gravelly sand

Bw—1 to 7 inches; gravelly loamy sand

Cr—7 to 59 inches; bedrock

### Description of Pinecity Soil

#### Classification

Mixed, thermic, shallow Typic Torripsamments

#### Setting

*Landform*: South-facing hills, at elevations below 1,585 meters

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Side slope

*Down-slope shape*: Linear

*Across-slope shape*: Linear

*Aspect (representative)*: Southwest

*Aspect range*: East to southwest (clockwise)

*Slope range*: 15 to 50 percent

## Soil Survey of Joshua Tree National Park, California

*Parent material:* Colluvium derived from granitoid and/or colluvium derived from gneiss over residuum weathered from gneiss and/or residuum weathered from granitoid  
*Vegetation:* Red brome, narrowleaf goldenbush, blackbrush, Mexican bladdersage, desert globemallow, and California juniper

### Properties and Qualities

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 0.4 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Shallow Cool Hills (R030XB189CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

### Typical Profile

A1—0 to 2 inches; gravelly loamy sand  
A2—2 to 7 inches; gravelly loamy sand  
Cr—7 to 59 inches; bedrock

## Minor Components

### Pinecity, strongly sloping soils

*Percent of map unit:* 5 percent  
*Slope:* 8 to 15 percent  
*Landform:* Hills  
*Ecological site:* Shallow Cool Hills (R030XB189CA)

### Rock outcrop

*Percent of map unit:* 5 percent  
*Slope:* 4 to 100 percent

### Pinecity, very steep soils

*Percent of map unit:* 4 percent  
*Slope:* 50 to 75 percent  
*Landform:* South-facing hills, at elevations below 1,585 meters  
*Ecological site:* Shallow Cool Hills (R030XB189CA)

### Smithcanyon, dry soils

*Percent of map unit:* 4 percent  
*Slope:* 50 to 75 percent  
*Landform:* North-facing hills, at elevations below 1,585 meters  
*Ecological site:* Dry Sandy Mountain Slopes (R030XE191CA)

### Smithcanyon, mesic soils

*Percent of map unit:* 4 percent  
*Slope:* 15 to 50 percent



*Landform:* Hills, at elevations above 1,585 meters

*Ecological site:* Dry Sandy Mountain Slopes (R030XE191CA)

**Thunderclap, rarely flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 4 to 15 percent

*Landform:* Hills

*Ecological site:* Xeric Very Deep Sandy Fan Aprons On Pediments (R030XE200CA)

## **3294—Smithcanyon gravelly sand, 30 to 75 percent slopes**

### **Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,440 to 5,740 feet

*Mean annual precipitation:* 5 to 10 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

### **Map Unit Composition**

Smithcanyon, dry and similar soils: 80 percent

Dissimilar minor components: 20 percent

### **Description of Smithcanyon, Dry Soil**

#### **Classification**

Mixed, thermic, shallow Xeric Torripsamments

#### **Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southwest

*Aspect range:* East to southwest (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid and/or colluvium derived from gneiss  
over residuum weathered from granitoid and/or residuum weathered from gneiss

*Vegetation:* Singleleaf pinyon, Muller oak, narrowleaf goldenbush, and cheatgrass

#### **Properties and Qualities**

*Depth to restrictive feature:* 3 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.5 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Dry Sandy Mountain Slopes (R030XE191CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A1—0 to 1 inch; gravelly sand

A2—1 to 9 inches; gravelly loamy sand

Cr—9 to 59 inches; bedrock

**Minor Components**

**Smithcanyon, dry, moderately steep soils**

*Percent of map unit:* 10 percent

*Slope:* 15 to 30 percent

*Landform:* Mountains

*Ecological site:* Dry Sandy Mountain Slopes (R030XE191CA)

**Rock outcrop**

*Percent of map unit:* 5 percent

*Slope:* 4 to 100 percent

**Xeric Torriorthents, dry**

*Percent of map unit:* 3 percent

*Slope:* 30 to 75 percent

*Landform:* Mountains

*Ecological site:* Dry Sandy Mountain Slopes (R030XE191CA)

**Arizo, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 15 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**3295—Desertqueen-Hexie-Rock outcrop complex, 15 to 50 percent slopes**

**Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,295 to 4,820 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

**Map Unit Composition**

Desertqueen, dry and similar soils: 40 percent

Hexie and similar soils: 20 percent

Rock outcrop: 20 percent

Dissimilar minor components: 20 percent

**Description of Desertqueen, Dry Soil**

**Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplargids

**Setting**

*Landform:* North-facing mountains

*Landform position (two-dimensional):* Summit, shoulder, and backslope

*Landform position (three-dimensional):* Upper third of mountain flank, crest, side slope, and nose slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southwest

*Aspect range:* East to west (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss

*Vegetation:* White ratany, burrobush, jojoba, Nevada jointfir, and Parish's goldeneye

**Properties and Qualities**

*Depth to restrictive feature:* 5 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.9 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 4 inches; sandy loam

Bt—4 to 11 inches; gravelly sandy loam

Crt—11 to 59 inches; bedrock

**Description of Hexie Soil**

**Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

**Setting**

*Landform:* South-facing mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Aspect (representative):* South

*Aspect range:* East to west (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss

*Vegetation:* Brownplume wirelettuce, red brome, big galleta, and Mojave yucca

**Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.9 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A1—0 to 1 inch; very gravelly fine sandy loam  
A2—1 to 5 inches; gravelly sandy loam  
Bt—5 to 9 inches; gravelly sandy loam  
Btk—9 to 39 inches; extremely paracobbly fine sandy loam  
Cr—39 to 59 inches; bedrock

**Description of Rock Outcrop**

**Setting**

*Landform:* Mountains  
*Aspect:* All aspects  
*Slope range:* 2 to 100 percent  
*Definition:* Areas of exposed gneiss without a soil mantle

**Minor Components**

**Helendale soils**

*Percent of map unit:* 10 percent  
*Slope:* 2 to 15 percent  
*Landform:* Fan remnants  
*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

**Contactmine, warm soils**

*Percent of map unit:* 5 percent  
*Slope:* 30 to 50 percent  
*Landform:* Mountains  
*Ecological site:* Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)

**Contactmine, dry soils**

*Percent of map unit:* 3 percent  
*Slope:* 2 to 15 percent  
*Landform:* Low hills and mountains  
*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

**Pinecity soils**

*Percent of map unit:* 2 percent  
*Slope:* 15 to 50 percent  
*Landform:* Mountains and hills  
*Ecological site:* Shallow Cool Hills (R030XB189CA)

## **3296—Desertqueen-Pinecity complex, 15 to 50 percent slopes**

### **Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,605 to 5,495 feet

*Mean annual precipitation:* 4 to 10 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 270 days

### **Map Unit Composition**

Desertqueen and similar soils: 45 percent

Pinecity and similar soils: 35 percent

Dissimilar minor components: 20 percent

### **Description of Desertqueen Soil**

#### **Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplargids

#### **Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Shoulder and backslope

*Landform position (three-dimensional):* Upper third of mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex and concave

*Aspect (representative):* North

*Aspect range:* Southwest to southeast (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss

*Vegetation:* Blackbrush, Parish's goldeneye, California juniper, and Eastern Mojave buckwheat

#### **Properties and Qualities**

*Depth to restrictive feature:* 8 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Shallow Cool Hills (R030XB189CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

A—0 to 2 inches; cobbly sand

AB—2 to 5 inches; cobbly loamy sand  
Bt—5 to 13 inches; cobbly sandy loam  
Crt—13 to 59 inches; bedrock

### Description of Pinecity Soil

#### Classification

Mixed, thermic, shallow Typic Torripsamments

#### Setting

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Southwest to southeast (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Red brome and blackbrush

#### Properties and Qualities

*Depth to restrictive feature:* 2 to 8 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Shallow Cool Hills (R030XB189CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### Typical Profile

A—0 to 2 inches; sand

Bw—2 to 6 inches; sand

Crt—6 to 59 inches; bedrock

### Minor Components

#### Smithcanyon soils

*Percent of map unit:* 6 percent

*Slope:* 15 to 50 percent

*Landform:* Hills

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

#### Rock outcrop

*Percent of map unit:* 5 percent

*Slope:* 4 to 50 percent

**Desertqueen, low slope soils**

*Percent of map unit:* 4 percent

*Slope:* 4 to 15 percent

*Landform:* Mountains

*Ecological site:* Shallow Cool Hills (R030XB189CA)

**Pinecity, cool soils**

*Percent of map unit:* 3 percent

*Slope:* 4 to 15 percent

*Landform:* Pediments

*Ecological site:* Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)

**Littlefargo soils**

*Percent of map unit:* 2 percent

*Slope:* 15 to 50 percent

*Landform:* Hills

*Ecological site:* Shallow Cool Hills (R030XB189CA)

**3297—Desertqueen-Contactmine-Seanna complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Landscape:* Hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,000 to 3,525 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

**Map Unit Composition**

Desertqueen, warm and similar soils: 40 percent

Contactmine, dry and similar soils: 20 percent

Seanna, dry and similar soils: 20 percent

Dissimilar minor components: 20 percent

**Description of Desertqueen, Warm Soil**

**Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplargids

**Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Concave

*Across-slope shape:* Convex

*Aspect (representative):* Northeast

*Aspect range:* Southwest to northeast (clockwise)

*Slope range:* 4 to 30 percent

*Parent material:* Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss

*Vegetation:* Redstem stork's bill, burrobush, Engelmann's hedgehog cactus, creosote bush, desert globemallow, and sowthistle desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* 4 to 14 inches to paralithic bedrock



*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 0.5 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

A—0 to 2 inches; sandy loam  
Bt—2 to 5 inches; sandy loam  
Crt—5 to 59 inches; bedrock

**Description of Contactmine, Dry Soil**

**Classification**

Fine-loamy, mixed, superactive, thermic Typic Haplargids

**Setting**

*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave  
*Aspect (representative):* Southwest  
*Aspect range:* South to northeast (clockwise)  
*Slope range:* 4 to 30 percent  
*Parent material:* Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss  
*Vegetation:* Burrobush, creosote bush, redstem stork's bill, white ratany, and Mojave yucca

**Properties and Qualities**

*Depth to restrictive feature:* 47 to 49 inches to paralithic bedrock  
*Shrink-swell potential:* Moderate (about 3.8 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 5.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* C

**Typical Profile**

A—0 to 2 inches; gravelly sandy loam  
Bw—2 to 5 inches; gravelly sandy loam  
Bt—5 to 12 inches; clay loam  
Btk—12 to 22 inches; paracobbly clay loam  
BCtk—22 to 47 inches; paragravelly sandy loam  
Crt—47 to 59 inches; bedrock

**Description of Seanna, Dry Soil**

**Classification**

Loamy-skeletal, mixed, superactive, calcareous, thermic, shallow Typic Torriorthents

**Setting**

*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear and convex  
*Aspect (representative):* Southwest  
*Aspect range:* South to northeast (clockwise)  
*Slope range:* 4 to 30 percent  
*Parent material:* Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss  
*Vegetation:* Redstem stork's bill, creosote bush, and bristly fiddleneck

**Properties and Qualities**

*Depth to restrictive feature:* 4 to 17 inches to paralithic bedrock  
*Shrink-swell potential:* Low (about 0.7 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Limy Hill 3-5" P.Z. (R030XB139CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; gravelly sandy loam  
Bk—1 to 8 inches; gravelly sandy loam  
Ck—8 to 15 inches; very paragravelly sandy loam  
Crk—15 to 59 inches; bedrock

### Minor Components

#### **Rock outcrop**

*Percent of map unit:* 10 percent

*Slope:* 2 to 100 percent

#### **Arizo, rarely flooded soils**

*Percent of map unit:* 8 percent

*Slope:* 2 to 4 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

#### **Arizo, occasionally flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Narrow drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

## **3325—Ironped-Rock outcrop-Hexie complex, 30 to 60 percent slopes**

### Map Unit Setting

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,295 to 5,775 feet

*Mean annual precipitation:* 3 to 10 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

### Map Unit Composition

Ironped, warm and similar soils: 30 percent

Rock outcrop: 20 percent

Hexie and similar soils: 15 percent

Ironped and similar soils: 15 percent

Dissimilar minor components: 20 percent

### Description of Ironped, Warm Soil

#### **Classification**

Mixed, thermic, shallow Typic Torripsamments

#### **Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank and side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Southwest to east (clockwise)

*Slope range:* 30 to 60 percent

*Parent material:* Colluvium derived from granitoid and/or residuum weathered from granitoid

*Vegetation:* Brittlebush, creosote bush, brittle spineflower, forbs, and annuals

### **Properties and Qualities**

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Thermic Steep South Slopes (R030XB164CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### **Typical Profile**

A—0 to 2 inches; gravelly sand

Bw—2 to 7 inches; gravelly sand

Cr—7 to 59 inches; bedrock

### **Description of Rock Outcrop**

#### **Setting**

*Landform:* Mountains

*Aspect:* All aspects

*Slope range:* 4 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

### **Description of Hexie Soil**

#### **Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

#### **Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Center third of mountain flank and side slope

*Down-slope shape:* Linear and convex

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* Southwest to east (clockwise)

*Slope range:* 30 to 60 percent

*Parent material:* Colluvium derived from granitoid and/or residuum weathered from granitoid

*Vegetation:* Burrobush, red brome, big galleta, Parish's goldeneye, and water jacket

### **Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 1.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.8 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 3 inches; gravelly sandy loam

Bt—3 to 13 inches; sandy loam

Btk—13 to 35 inches; gravelly sandy loam

Cr—35 to 59 inches; bedrock

## Description of Ironped Soil

### Classification

Mixed, thermic, shallow Typic Torripsamments

### Setting

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank and side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* Southwest to east (clockwise)

*Slope range:* 30 to 60 percent

*Parent material:* Colluvium derived from granitoid and/or residuum weathered from granitoid

*Vegetation:* Parish's goldeneye, creosote bush, catclaw acacia, Eastern Mojave buckwheat, Nevada jointfir, and redstem stork's bill

### Properties and Qualities

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

A—0 to 2 inches; gravelly sand  
Bw—2 to 7 inches; gravelly sand  
Cr—7 to 59 inches; bedrock

**Minor Components**

**Pinecity, cool soils**

*Percent of map unit:* 10 percent  
*Slope:* 30 to 50 percent  
*Landform:* Hills  
*Ecological site:* Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)

**Aguilareal soils**

*Percent of map unit:* 3 percent  
*Slope:* 60 to 75 percent  
*Landform:* Side slopes of hills  
*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

**Desertqueen soils**

*Percent of map unit:* 3 percent  
*Slope:* 30 to 50 percent  
*Landform:* Hills  
*Ecological site:* Shallow Cool Hills (R030XB189CA)

**Ironped, warm, moderately steep soils**

*Percent of map unit:* 2 percent  
*Slope:* 15 to 30 percent  
*Landform:* Hills  
*Ecological site:* Thermic Steep South Slopes (R030XB164CA)

**Morongo, occasionally flooded soils**

*Percent of map unit:* 1 percent  
*Slope:* 4 to 15 percent  
*Landform:* Drainageways  
*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Smithcanyon soils**

*Percent of map unit:* 1 percent  
*Slope:* 30 to 60 percent  
*Landform:* Mountains, at elevations above 1,585 meters  
*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

**3335—Xeric Torriorthents-Rock outcrop association, 15 to 75 percent slopes**

**Map Unit Setting**

*Landscape:* Hills  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 3,605 to 5,495 feet  
*Mean annual precipitation:* 7 to 10 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 270 days

#### **Map Unit Composition**

Xeric Torriorthents and similar soils: 40 percent

Rock outcrop: 25 percent

Xeric Torriorthents, warm and similar soils: 25 percent

Dissimilar minor components: 10 percent

#### **Description of Xeric Torriorthents**

##### **Classification**

Xeric Torriorthents

##### **Setting**

*Landform:* High-elevation, north-facing side slopes of hills

*Landform position (two-dimensional):* Shoulder and backslope

*Landform position (three-dimensional):* Nose slope and side slope

*Down-slope shape:* Linear and convex

*Across-slope shape:* Linear and convex

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Singleleaf pinyon, blackbrush, and Muller oak

##### **Properties and Qualities**

*Depth to restrictive feature:* 20 to 59 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

##### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.1 inches)

##### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

##### **Typical Profile**

A—0 to 9 inches; gravelly loamy sand

C1—9 to 26 inches; very gravelly loamy sand

C2—26 to 36 inches; extremely gravelly loamy sand

C3—36 to 50 inches; gravelly sand

Cr—50 to 59 inches; bedrock

#### **Description of Rock Outcrop**

##### **Setting**

*Landform:* Hills



*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

### **Description of Xeric Torriorthents, Warm**

#### **Classification**

Xeric Torriorthents

#### **Setting**

*Landform:* Low-elevation, south-facing side slopes of hills

*Landform position (two-dimensional):* Shoulder and backslope

*Landform position (three-dimensional):* Nose slope and side slope

*Down-slope shape:* Linear and convex

*Across-slope shape:* Linear and convex

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Singleleaf pinyon, Muller oak, narrowleaf goldenbush, and cheatgrass

#### **Properties and Qualities**

*Depth to restrictive feature:* 20 to 59 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.1 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Dry Sandy Mountain Slopes (R030XE191CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 9 inches; gravelly loamy sand

C1—9 to 26 inches; very gravelly loamy sand

C2—26 to 36 inches; extremely gravelly loamy sand

C3—36 to 50 inches; gravelly sand

Cr—50 to 59 inches; bedrock

### **Minor Components**

#### **Smithcanyon, dry soils**

*Percent of map unit:* 10 percent

*Slope:* 15 to 30 percent

*Landform:* Hills

*Ecological site:* Dry Sandy Mountain Slopes (R030XE191CA)

## **3336—Xeric Torriorthents-Bigbernie association, 30 to 75 percent slopes**

### **Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,130 to 5,410 feet

*Mean annual precipitation:* 3 to 10 inches

*Mean annual air temperature:* 55 to 73 degrees F

*Frost-free period:* 210 to 340 days

### **Map Unit Composition**

Xeric Torriorthents and similar soils: 45 percent

Bigbernie and similar soils: 25 percent

Dissimilar minor components: 30 percent

### **Description of Xeric Torriorthents**

#### **Classification**

Xeric Torriorthents

#### **Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Southwest to east (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Cheatgrass, Muller oak, California juniper, and singleleaf pinyon

#### **Properties and Qualities**

*Depth to restrictive feature:* 20 to 59 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.1 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 9 inches; gravelly loamy sand

C1—9 to 26 inches; very gravelly loamy sand  
C2—26 to 36 inches; extremely gravelly loamy sand  
C3—36 to 50 inches; gravelly sand  
Cr—50 to 59 inches; bedrock

### Description of Bigbernie Soil

#### Classification

Sandy-skeletal, mixed, thermic Typic Torriorthents

#### Setting

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* East to southwest (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from granitoid and/or colluvium derived from gneiss  
over residuum weathered from granitoid and/or residuum weathered from gneiss

*Vegetation:* California juniper, bastardsage, green rabbitbrush, wishbone-bush,  
blackbrush, and Eastern Mojave buckwheat

#### Properties and Qualities

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.8 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Moderately Deep Gravelly Mountain Slopes (R030XB213CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### Typical Profile

A—0 to 1 inch; gravelly loamy sand

Bw—1 to 4 inches; very gravelly loamy sand

BC—4 to 24 inches; very gravelly sand

Cr—24 to 59 inches; bedrock

### Minor Components

#### Goldenhills, warm soils

*Percent of map unit:* 8 percent

*Slope:* 30 to 75 percent

*Landform:* South-facing side slopes of mountains

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

**Rock outcrop**

*Percent of map unit:* 8 percent

*Slope:* 4 to 100 percent

**Chutes**

*Percent of map unit:* 5 percent

*Slope:* 60 to 100 percent

**Pinecity, warm soils**

*Percent of map unit:* 3 percent

*Slope:* 50 to 75 percent

*Landform:* Mountains

*Ecological site:* Moderately Deep Gravelly Mountain Slopes (R030XB213CA)

**Arizo, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 15 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Pinecity soils**

*Percent of map unit:* 2 percent

*Slope:* 8 to 30 percent

*Landform:* Ridges

*Ecological site:* Shallow Cool Hills (R030XB189CA)

**Smithcanyon, dry soils**

*Percent of map unit:* 2 percent

*Slope:* 50 to 75 percent

*Landform:* Mountains

*Ecological site:* Dry Sandy Mountain Slopes (R030XE191CA)

**3340—Seanna-Grubstake-Pinecity complex, 30 to 75 percent slopes**

**Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,495 to 5,445 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

**Map Unit Composition**

Seanna and similar soils: 35 percent

Grubstake, moist and similar soils: 20 percent

Pinecity and similar soils: 15 percent

Dissimilar minor components: 30 percent

**Description of Seanna Soil**

**Classification**

Loamy-skeletal, mixed, superactive, calcareous, thermic, shallow Typic Torriorthents

**Setting**

*Landform:* South-facing and/or low-elevation slopes on mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Center third of mountain flank and side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear and convex

*Aspect (representative):* South

*Aspect range:* East to southwest (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss

*Vegetation:* Burrobush, creosote bush, redstem stork's bill, white ratany, and Mojave yucca

**Properties and Qualities**

*Depth to restrictive feature:* 4 to 17 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; sandy loam

Bk—1 to 6 inches; gravelly sandy loam

Ck—6 to 17 inches; very gravelly sandy loam

Crk—17 to 59 inches; bedrock

**Description of Grubstake, Moist Soil**

**Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplocambids

**Setting**

*Landform:* South-facing and low-elevation (below 1,200 meters) mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Upper third of mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* South

*Aspect range:* Southeast to southwest (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss

*Vegetation:* White ratany, burrobush, creosote bush, redstem stork's bill, big galleta, and Nevada jointfir

**Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to paralithic bedrock; 18 to 37 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.9 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

C—0 to 2 inches; gravel

A—2 to 3 inches; gravelly sandy loam

Bw—3 to 18 inches; sandy loam

Cr—18 to 30 inches; bedrock

R—30 to 39 inches; bedrock

**Description of Pinecity Soil**

**Classification**

Mixed, thermic, shallow Typic Torripsamments

**Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* West to east (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from gneiss over residuum weathered from gneiss

*Vegetation:* Red brome, narrowleaf goldenbush, blackbrush, Mexican bladdersage, desert globemallow, and California juniper

**Properties and Qualities**

*Depth to restrictive feature:* 8 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.6 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Shallow Cool Hills (R030XB189CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 2 inches; gravelly loamy sand

Bw—2 to 9 inches; gravelly loamy sand

Cr—9 to 59 inches; bedrock

**Minor Components**

**Rock outcrop**

*Percent of map unit:* 10 percent

*Slope:* 4 to 100 percent

**Seanna, non-rocky soils**

*Percent of map unit:* 10 percent

*Slope:* 15 to 30 percent

*Landform:* Low hills and mountains

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

**Contactmine, dry soils**

*Percent of map unit:* 4 percent

*Slope:* 30 to 75 percent

*Landform:* South-facing and low-elevation slopes of mountains

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

**Hexie soils**

*Percent of map unit:* 2 percent

*Slope:* 30 to 75 percent

*Landform:* Hills

*Ecological site:* Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)

**Seanna, warm soils**

*Percent of map unit:* 2 percent

*Slope:* 30 to 75 percent

*Landform:* North-facing and/or high-elevation slopes of mountains

*Ecological site:* Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)

**Cajon, rarely flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 4 to 8 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Seanna, cool soils**

*Percent of map unit:* 1 percent

*Slope:* 30 to 75 percent

*Landform:* High-elevation slopes and shoulders of mountains

*Ecological site:* Shallow Cool Hills (R030XB189CA)



## 3345—Bigcanyon association, 30 to 75 percent slopes

### Map Unit Setting

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,130 to 4,425 feet

*Mean annual precipitation:* 3 to 10 inches

*Mean annual air temperature:* 55 to 73 degrees F

*Frost-free period:* 270 to 360 days

### Map Unit Composition

Bigcanyon and similar soils: 55 percent

Bigcanyon, cool and similar soils: 20 percent

Dissimilar minor components: 25 percent

### Description of Bigcanyon Soil

#### Classification

Mixed, thermic Typic Torripsamments

#### Setting

*Landform:* South-facing side slopes of mountains, at elevations between 792 and 1,128 meters

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountain flank

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southwest

*Aspect range:* Northeast to west (clockwise)

*Slope range:* 30 to 75 percent

*Parent material:* Colluvium derived from gneiss and/or colluvium derived from granitoid over residuum weathered from granitoid and/or residuum weathered from gneiss

*Vegetation:* Catclaw acacia, sowthistle desertdandelion, creosote bush, Nevada jointfir, Parish's goldeneye, Parry's jujube, and burrobrush

#### Properties and Qualities

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 0.5 inch; sand  
C1—0.5 inch to 14 inches; coarse sand  
C2—14 to 20 inches; parastony sand  
Cr—20 to 59 inches; bedrock

**Description of Bigcanyon, Cool Soil**

**Classification**

Mixed, thermic Typic Torripsamments

**Setting**

*Landform:* North-facing side slopes of mountains, at elevations below 1,000 meters  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Mountain flank  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* Northwest  
*Aspect range:* West to northeast (clockwise)  
*Slope range:* 30 to 75 percent  
*Parent material:* Colluvium derived from gneiss and/or colluvium derived from granitoid over residuum weathered from granitoid and/or residuum weathered from gneiss  
*Vegetation:* California juniper, Sandberg bluegrass, and sowthistle desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.2 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8  
*Ecological site:* Moderately Deep Gravelly Mountain Slopes (R030XB213CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; sand  
Bw1—1 to 9 inches; sand  
Bw2—9 to 23 inches; sand  
Cr—23 to 59 inches; bedrock

**Minor Components**

**Ironped soils**

*Percent of map unit:* 10 percent  
*Slope:* 15 to 30 percent  
*Landform:* South-facing slopes of mountains, at elevations above 792 meters  
*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

**Smithcanyon, dry soils**

*Percent of map unit:* 7 percent

*Slope:* 30 to 75 percent

*Landform:* North-facing slopes of mountains, at elevations above 950 meters

*Ecological site:* Dry Sandy Mountain Slopes (R030XE191CA)

**Whiterobe, cool soils**

*Percent of map unit:* 3 percent

*Slope:* 30 to 75 percent

*Landform:* South-facing slopes of mountains, at elevations below 800 meters

*Ecological site:* Hyperthermic Steep North Slopes (R030XD040CA)

**Morongo, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 8 to 30 percent

*Landform:* Mountains

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Rock outcrop**

*Percent of map unit:* 2 percent

*Slope:* 4 to 100 percent

**Arizo, very rarely flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 4 to 15 percent

*Landform:* Stream terraces

*Ecological site:* Sandy Fan Aprons (R030XB174CA)

**3440—Pacific Mesa complex, 8 to 50 percent slopes**

**Map Unit Setting**

*Landscape:* Mountains

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,460 to 4,265 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Pacific Mesa, steep and similar soils: 65 percent

Pacific Mesa and similar soils: 30 percent

Dissimilar minor components: 5 percent

**Description of Pacific Mesa, Steep Soil**

**Classification**

Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids

**Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* West

*Aspect range:* South to north (clockwise)

*Slope range:* 15 to 50 percent

*Parent material:* Residuum weathered from andesite

*Vegetation:* Creosote bush, burrobush, and desert globemallow

#### **Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.9 inch)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

A—0 to 3 inches; gravelly sandy loam

Bkq1—3 to 9 inches; very gravelly sandy loam

Bkq2—9 to 16 inches; extremely cobbly sandy loam

R—16 to 26 inches; bedrock

### **Description of Pacific Mesa Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids

#### **Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* West

*Aspect range:* South to north (clockwise)

*Slope range:* 8 to 15 percent

*Parent material:* Residuum weathered from andesite

*Vegetation:* Creosote bush, redstem stork's bill, burrobush, and red brome

#### **Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy 5-7" p.z. (Low Production) (R030XB156CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A1—0 to 0 inches; silt loam

A2—0 to 2 inches; silt loam

Bkq1—2 to 9 inches; very gravelly sandy loam

Bkq2—9 to 17 inches; extremely cobbly sandy loam

R—17 to 26 inches; bedrock

**Minor Components**

**Marsite soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 30 percent

*Landform:* Hills

*Ecological site:* Limy Hill 3-5" P.Z. (R030XB139CA)

**3509—Cajon-Friedliver complex, 2 to 8 percent slopes,  
moist**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,555 to 3,440 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Cajon, very rarely flooded and similar soils: 60 percent

Friedliver and similar soils: 20 percent

Dissimilar minor components: 20 percent

**Description of Cajon, Very Rarely Flooded Soil**

**Classification**

Mixed, thermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northwest

*Aspect range:* West to northeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Chia, burrobush, creosote bush, and Hall's shrubby-spurge

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Very rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Moderately Deep To Very Deep Loamy Fan Remnants  
(R030XB218CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; sand

Bw—1 to 19 inches; loamy sand

C1—19 to 38 inches; gravelly loamy coarse sand

C2—38 to 59 inches; gravelly coarse sand

**Description of Friedliver Soil**

**Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

**Setting**

*Landform:* Fan aprons on fan remnants

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush and bristly fiddleneck

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 2

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Moderate (about 6.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Moderately Deep To Very Deep Loamy Fan Remnants  
(R030XB218CA)

*Hydric soil status:* No

*Hydrologic soil group:* B

**Typical Profile**

A—0 to 1 inch; very gravelly loamy sand

C—1 to 16 inches; very gravelly loamy sand

2Btk1—16 to 33 inches; gravelly sandy loam

2Btk2—33 to 59 inches; gravelly sandy loam

**Minor Components**

**Gocougs, warm soils**

*Percent of map unit:* 7 percent

*Slope:* 4 to 15 percent

*Landform:* Fan aprons on fan remnants

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

**Cajon soils**

*Percent of map unit:* 6 percent

*Slope:* 2 to 8 percent

*Landform:* Fan aprons

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

**Cajon, rarely flooded soils**

*Percent of map unit:* 4 percent

*Slope:* 2 to 8 percent

*Landform:* Drainageways

*Ecological site:* Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream  
(R030XY188CA)

**Olympus, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Drainageways on fan remnants

*Ecological site:* Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream  
(R030XY188CA)

**Cajon, frequently flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 8 percent

*Landform:* Channels

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**3525—Cajon-Friedliver complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert



## Soil Survey of Joshua Tree National Park, California

*Elevation:* 1,965 to 3,115 feet  
*Mean annual precipitation:* 4 to 7 inches  
*Mean annual air temperature:* 63 to 68 degrees F  
*Frost-free period:* 270 to 320 days

### Map Unit Composition

Cajon and similar soils: 70 percent  
Friedliver and similar soils: 15 percent  
Dissimilar minor components: 15 percent

### Description of Cajon Soil

#### Classification

Mixed, thermic Typic Torripsamments

#### Setting

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* Northwest to northeast (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush, bristly fiddleneck, Asian mustard, and smooth desertdandelion

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.2 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* Very rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.5 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

#### Typical Profile

A—0 to 1 inch; gravelly sand  
C1—1 to 4 inches; gravelly sand  
C2—4 to 20 inches; gravelly sand  
C3—20 to 59 inches; gravelly sand

### Description of Friedliver Soil

#### Classification

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

**Setting**

*Landform:* Fan aprons on fan remnants

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Curvenut combseed, creosote bush, burrobrush, branched pencil cholla, and sowthistle desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.2 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly sand

AC—1 to 5 inches; gravelly coarse sand

C—5 to 16 inches; gravelly sand

2Bt—16 to 32 inches; sandy loam

2Btk—32 to 39 inches; sandy loam

2Ck—39 to 59 inches; gravelly loamy sand

**Minor Components**

**Burntshack soils**

*Percent of map unit:* 7 percent

*Slope:* 2 to 8 percent

*Landform:* Fan aprons on fan remnants

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

**Silvermine soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 8 percent

*Landform:* Fan remnants

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

**Blackmagic soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

**Silvermine, stable soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

**Rock outcrop**

*Percent of map unit:* 1 percent

*Slope:* 2 to 50 percent

## **3526—Cajon-Hypoint-Arizo association, 1 to 4 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,375 to 3,785 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

### **Map Unit Composition**

Cajon and similar soils: 40 percent

Hypoint and similar soils and similar soils: 35 percent

Arizo, occasionally flooded and similar soils: 15 percent

Dissimilar minor components: 10 percent

### **Description of Cajon Soil**

#### **Classification**

Mixed, thermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 1 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, bristly fiddleneck, wollystar, and smooth desertdandelion

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.3 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; gravelly loamy sand

C1—1 to 33 inches; gravelly loamy sand

C2—33 to 61 inches; gravelly sand

### **Description of Hypoint Soil**

#### **Classification**

Sandy, mixed, thermic Typic Torriorthents

#### **Setting**

*Landform:* Fan aprons

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 1 to 4 percent

*Parent material:* Alluvium derived from igneous rock

*Vegetation:* Creosote bush, bristly fiddleneck, desertsenna, and burrobush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.8 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Gravelly Outwash (R030XY159CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; loamy fine sand

Bw—1 to 19 inches; sand

C—19 to 59 inches; very gravelly sand

### Description of Arizo, Occasionally Flooded Soil

#### Classification

Sandy-skeletal, mixed, thermic Typic Torriorthents

#### Setting

*Landform:* Drainageways

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 1 to 4 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Burrobrush, creosote bush, smooth desertdandelion, and catclaw acacia

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.3 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### Typical Profile

C1—0 to 2 inches; gravelly coarse sand

C2—2 to 10 inches; very gravelly coarse sand

C3—10 to 59 inches; extremely gravelly coarse sand

#### Minor Components

##### Arizo, frequently flooded soils

*Percent of map unit:* 5 percent

*Slope:* 1 to 4 percent

*Landform:* Channels

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

##### Helendale soils

*Percent of map unit:* 5 percent

*Slope:* 4 to 15 percent

*Landform:* Fan remnants

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

## 3611—Burntshack association, 2 to 15 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,395 to 4,050 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 340 days

### Map Unit Composition

Burntshack, sand surface and similar soils: 50 percent

Burntshack and similar soils: 35 percent

Dissimilar minor components: 15 percent

### Description of Burntshack, Sand Surface Soil

#### Classification

Loamy, mixed, superactive, thermic Arenic Haplargids

#### Setting

*Landform:* Fan aprons on fan remnants

*Landform position (two-dimensional):* Summit and backslope

*Landform position (three-dimensional):* Side slope and interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Big galleta, creosote bush, burrobush, burrobrush, Mojave yucca, and white ratany

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.8 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.6 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Sandy Fan Aprons (R030XB174CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### Typical Profile

A—0 to 2 inches; coarse sand

AB—2 to 7 inches; sand

Bw—7 to 12 inches; sand  
2Bt1—12 to 30 inches; loamy coarse sand  
2Bt2—30 to 39 inches; sandy loam  
2C—39 to 59 inches; loamy coarse sand

### **Description of Burntshack Soil**

#### **Classification**

Loamy, mixed, superactive, thermic Arenic Haplargids

#### **Setting**

*Landform*: Fan aprons on fan remnants

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Side slope and interfluvium

*Down-slope shape*: Linear

*Across-slope shape*: Convex

*Aspect (representative)*: Northeast

*Aspect range*: Northwest to east (clockwise)

*Slope range*: 8 to 15 percent

*Parent material*: Alluvium derived from granitoid

*Vegetation*: Big galleta, creosote bush, burrobush, burrobrush, Mojave yucca, and white ratany

#### **Properties and Qualities**

*Depth to restrictive feature*: None within a depth of 60 inches

*Shrink-swell potential*: Low (about 0.8 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Well drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Low (about 4.6 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 7e

*Ecological site*: Sandy Fan Aprons (R030XB174CA)

*Hydric soil status*: No

*Hydrologic soil group*: A

#### **Typical Profile**

A—0 to 2 inches; sand

AB—2 to 7 inches; sand

Bw—7 to 12 inches; sand

2Bt1—12 to 30 inches; loamy coarse sand

2Bt2—30 to 39 inches; sandy loam

2C—39 to 59 inches; loamy coarse sand

### **Minor Components**

#### **Morongo, very rarely flooded soils**

*Percent of map unit*: 10 percent

*Slope*: 4 to 8 percent

*Landform*: Inset fans

*Ecological site*: Sandy Fan Aprons (R030XB174CA)



**Morongo, rarely flooded soils**

*Percent of map unit:* 4 percent

*Slope:* 4 to 8 percent

*Landform:* Narrow drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Rock outcrop**

*Percent of map unit:* 1 percent

*Slope:* 4 to 30 percent

**3612—Burntshack association, 2 to 4 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,785 to 3,525 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Burntshack and similar soils: 75 percent

Burntshack, occasionally flooded and similar soils: 20 percent

Dissimilar minor components: 5 percent

**Description of Burntshack Soil**

**Classification**

Loamy, mixed, superactive, thermic Arenic Haplargids

**Setting**

*Landform:* Fan aprons on fan remnants

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to south (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Burrobush and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 5.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; sand

C—2 to 17 inches; sand

2Bk—17 to 27 inches; coarse sand

2Btk—27 to 59 inches; gravelly sandy loam

**Description of Burntshack, Occasionally Flooded Soil**

**Classification**

Loamy, mixed, superactive, thermic Arenic Haplargids

**Setting**

*Landform:* Inset fans

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* East

*Aspect range:* North to south (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Burrobrush, creosote bush, smooth desertdandelion, and catclaw acacia

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 5.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic

Ephemeral Stream (R030XY010CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; gravelly sand

C—2 to 17 inches; sand

2Bk—17 to 27 inches; coarse sand

2Btk—27 to 59 inches; gravelly sandy loam

### Minor Components

#### **Arizo, occasionally flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Inset fans

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

## **3676—Morongo loamy sand, 2 to 4 percent slopes**

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,670 to 4,755 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

### Map Unit Composition

Morongo, loamy sand, very rarely flooded and similar soils: 80 percent

Dissimilar minor components: 20 percent

### Description of Morongo, Loamy Sand, Very Rarely Flooded Soil

#### **Classification**

Mixed, thermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* West

*Aspect range:* South to northwest (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Big galleta, creosote bush, burrobush, burrobrush, Mojave yucca, and  
white ratany

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Very rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated): 7e*

*Ecological site: Sandy Fan Aprons (R030XB174CA)*

*Hydric soil status: No*

*Hydrologic soil group: A*

**Typical Profile**

A—0 to 0 inches; loamy sand

C1—0 to 20 inches; loamy sand

C2—20 to 60 inches; loamy sand

**Minor Components**

**Jumborox, dry soils**

*Percent of map unit: 10 percent*

*Slope: 2 to 8 percent*

*Landform: Fan remnants*

*Ecological site: Coarse Loamy Very Deep Fan Remnants (R030XB173CA)*

**Morongo, rarely flooded soils**

*Percent of map unit: 5 percent*

*Slope: 2 to 4 percent*

*Landform: Stream terraces*

*Ecological site: Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)*

**Morongo, frequently flooded soils**

*Percent of map unit: 4 percent*

*Slope: 2 to 4 percent*

*Landform: Active channels*

*Ecological site: Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)*

**Riverwash**

*Percent of map unit: 1 percent*

*Slope: 2 to 8 percent*

**3677—Morongo sand, 2 to 4 percent slopes**

**Map Unit Setting**

*Landscape: Fan piedmonts*

*Major land resource area: 30—Mojave Desert*

*Elevation: 3,295 to 3,805 feet*

*Mean annual precipitation: 4 to 7 inches*

*Mean annual air temperature: 55 to 68 degrees F*

*Frost-free period: 210 to 320 days*

**Map Unit Composition**

Morongo and similar soils: 80 percent

Dissimilar minor components: 20 percent

**Description of Morongo Soil**

**Classification**

Mixed, thermic Typic Torripsamments

**Setting**

*Landform: Fan aprons*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* Northwest  
*Aspect range:* Southwest to north (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Bristly fiddleneck, creosote bush, Joshua tree, and burrobrush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 3.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; sand  
Bw—1 to 6 inches; sand  
C1—6 to 28 inches; sand  
C2—28 to 59 inches; coarse sand

**Minor Components**

**Morongo, very rarely flooded soils**

*Percent of map unit:* 8 percent  
*Slope:* 2 to 4 percent  
*Landform:* Fan aprons  
*Ecological site:* Sandy Fan Aprons (R030XB174CA)

**Ambrosia soils**

*Percent of map unit:* 5 percent  
*Slope:* 2 to 4 percent  
*Landform:* Fan aprons  
*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

**Jumborox, warm soils**

*Percent of map unit:* 5 percent  
*Slope:* 2 to 8 percent  
*Landform:* Fan remnants  
*Ecological site:* Loamy Very Deep Fan Remnants (R030XB183CA)

**Morongo, rarely flooded soils**

*Percent of map unit:* 2 percent  
*Slope:* 2 to 4 percent

*Landform:* Narrow drainageways

*Ecological site:* Rarely Flooded Warm Thermic Ephemeral System (R030XY187CA)

## **3679—Morongo-Jumborox complex, 2 to 8 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,280 to 5,085 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 270 days

### **Map Unit Composition**

Morongo, cool and similar soils: 55 percent

Jumborox and similar soils: 20 percent

Dissimilar minor components: 25 percent

### **Description of Morongo, Cool Soil**

#### **Classification**

Mixed, thermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Southwest to northeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from gneiss and/or alluvium derived from granitoid

*Vegetation:* Cheatgrass, blackbrush, and California juniper

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 2 inches; sand  
BA—2 to 6 inches; sand  
Bw—6 to 19 inches; loamy sand  
C—19 to 59 inches; loamy sand

### Description of Jumborox Soil

#### Classification

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

#### Setting

*Landform*: Fan remnants  
*Landform position (two-dimensional)*: Backslope  
*Landform position (three-dimensional)*: Side slope  
*Down-slope shape*: Linear and convex  
*Across-slope shape*: Linear and convex  
*Aspect (representative)*: Northeast  
*Aspect range*: Southwest to south (clockwise)  
*Slope range*: 2 to 8 percent  
*Parent material*: Alluvium derived from gneiss and/or alluvium derived from granitoid  
*Vegetation*: Muller oak, blackbrush, Eastern Mojave buckwheat, red brome, and pincushion flower

#### Properties and Qualities

*Depth to restrictive feature*: None within a depth of 60 inches  
*Shrink-swell potential*: Low (about 0.9 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High  
*Natural drainage class*: Well drained  
*Flooding frequency*: None  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Low (about 5.4 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7e  
*Ecological site*: Cool Deep Sandy Fans (R030XB168CA)  
*Hydric soil status*: No  
*Hydrologic soil group*: A

### Typical Profile

A1—0 to 1 inch; sand  
A2—1 to 4 inches; loamy sand  
Bt1—4 to 14 inches; sandy loam  
Bt2—14 to 22 inches; sandy loam  
Bt3—22 to 37 inches; loamy sand  
BCt—37 to 71 inches; loamy sand

### Minor Components

#### Bluecut, cool soils

*Percent of map unit*: 8 percent  
*Slope*: 2 to 4 percent



*Landform:* Fan aprons on fan remnants

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

**Morongo, cool, strongly sloping soils**

*Percent of map unit:* 7 percent

*Slope:* 8 to 15 percent

*Landform:* Fan aprons

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

**Jumborox soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Fan remnants

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

**Morongo, very rarely flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Stream terraces

*Ecological site:* Very Rarely To Rarely Flooded Thermic Ephemeral Stream  
(R030XY202CA)

**Morongo, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 8 percent

*Landform:* Channels

*Ecological site:* Very Rarely To Rarely Flooded Thermic Ephemeral Stream  
(R030XY202CA)

## **3680—Morongo loamy sand, 2 to 8 percent slopes, dry**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,095 to 3,440 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

### **Map Unit Composition**

Morongo and similar soils: 85 percent

Dissimilar minor components: 15 percent

### **Description of Morongo Soil**

#### **Classification**

Mixed, thermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

## Soil Survey of Joshua Tree National Park, California

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, burrobush, Nevada jointfir, desertsenna, Mexican bladdersage, and Mojave yucca

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.3 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A1—0 to 1 inch; loamy sand

A2—1 to 2 inches; sand

C1—2 to 35 inches; sand

C2—35 to 59 inches; coarse sand

## Minor Components

### Morongo, strongly sloping soils

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Upper fan aprons

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

### Helendale, very rarely flooded soils

*Percent of map unit:* 4 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

### Morongo, frequently flooded soils

*Percent of map unit:* 2 percent

*Slope:* 2 to 8 percent

*Landform:* Channels

*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

### Morongo, rarely flooded soils

*Percent of map unit:* 2 percent

*Slope:* 2 to 8 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)

**Urban land**

*Percent of map unit:* 2 percent

**3681—Morongo-Jumborox complex, 4 to 8 percent slopes, warm**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,510 to 4,280 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

**Map Unit Composition**

Morongo, very rarely flooded and similar soils: 45 percent

Jumborox, dry and similar soils: 35 percent

Dissimilar minor components: 20 percent

**Description of Morongo, Very Rarely Flooded Soil**

**Classification**

Mixed, thermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granite and gneiss

*Vegetation:* Big galleta, creosote bush, burrobush, burrobrush, Mojave yucca, and white ratany

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Very rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.2 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Sandy Fan Aprons (R030XB174CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; sand

Bw—1 to 6 inches; sand

C1—6 to 28 inches; sand

C2—28 to 59 inches; coarse sand

**Description of Jumborox, Dry Soil**

**Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granite and gneiss

*Vegetation:* Big galleta, creosote bush, and red brome

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.9 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 5.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Coarse Loamy Very Deep Fan Remnants (R030XB173CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A1—0 to 1 inch; sand

A2—1 to 4 inches; loamy sand

Bt1—4 to 14 inches; sandy loam

Bt2—14 to 22 inches; sandy loam

Bt3—22 to 37 inches; loamy sand

BCt—37 to 71 inches; loamy sand

**Minor Components**

**Morongo, very rarely flooded, strongly sloping soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Fan aprons

*Ecological site:* Sandy Fan Aprons (R030XB174CA)

**Desertqueen soils**

*Percent of map unit:* 4 percent

*Slope:* 4 to 15 percent

*Landform:* Pediments

*Ecological site:* Cool Shallow Fans Over Pediment (R030XB188CA)

**Rock outcrop**

*Percent of map unit:* 4 percent

*Slope:* 2 to 15 percent

**Yander, very rarely flooded soils**

*Percent of map unit:* 4 percent

*Slope:* 4 to 8 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Sandy Fan Aprons (R030XB174CA)

**Morongo, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Narrow drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Pinecity soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

## **3682—Morongo-Jumborox-Urban land complex, 4 to 8 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,280 to 4,180 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 270 days

### **Map Unit Composition**

Morongo, cool and similar soils: 50 percent

Jumborox and similar soils: 15 percent

Urban land: 15 percent

Dissimilar minor components: 20 percent

### **Description of Morongo, Cool Soil**

#### **Classification**

Mixed, thermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from gneiss and/or alluvium derived from granitoid

*Vegetation:* Cheatgrass, blackbrush, and California juniper

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 2 inches; sand

BA—2 to 6 inches; sand

Bw—6 to 19 inches; loamy sand

C—19 to 59 inches; loamy sand

### **Description of Jumborox Soil**

#### **Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

#### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear and convex

*Across-slope shape:* Linear and convex

*Aspect (representative):* Northwest

*Aspect range:* West to northeast (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from gneiss and/or alluvium derived from granitoid

*Vegetation:* Muller oak, blackbrush, Eastern Mojave buckwheat, red brome, and pincushion flower

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.3 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A1—0 to 2 inches; loamy sand

A2—2 to 8 inches; gravelly loamy sand

Bt1—8 to 21 inches; sandy loam

Bt2—21 to 33 inches; loamy sand

C—33 to 59 inches; sand

### **Description of Urban Land**

#### **Setting**

*Landform:* Fan aprons and fan remnants

*Definition:* Areas with houses; areas with concrete and/or other man-made, impervious surfaces

### **Minor Components**

#### **Jumborox, strongly sloping soils**

*Percent of map unit:* 7 percent

*Slope:* 8 to 15 percent

*Landform:* Fan remnants

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

#### **Morongo, very rarely flooded soils**

*Percent of map unit:* 6 percent

*Slope:* 2 to 4 percent

*Landform:* Stream terraces

*Ecological site:* Very Rarely To Rarely Flooded Thermic Ephemeral Stream (R030XY202CA)

#### **Morongo, cool, strongly sloping soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Fan aprons

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

#### **Morongo, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 8 percent

*Landform:* Channels

*Ecological site:* Very Rarely To Rarely Flooded Thermic Ephemeral Stream (R030XY202CA)



## **3683—Morongo-Bluecut association, 2 to 8 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 2,115 to 3,655 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 63 to 68 degrees F  
*Frost-free period:* 280 to 320 days

### **Map Unit Composition**

Morongo and similar soils: 55 percent  
Bluecut, very rarely flooded and similar soils: 30 percent  
Dissimilar minor components: 15 percent

### **Description of Morongo Soil**

#### **Classification**

Mixed, thermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* North  
*Aspect range:* Northwest to northeast (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush, pincushion flower, redstem stork's bill, and burrobrush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 3.0 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 1 inch; loamy sand  
C—1 to 59 inches; gravelly coarse sand

### Description of Bluecut, Very Rarely Flooded Soil

#### Classification

Fine-loamy, mixed, superactive, thermic Typic Paleargids

#### Setting

*Landform*: Fan remnants

*Landform position (two-dimensional)*: Summit

*Landform position (three-dimensional)*: Interfluve

*Down-slope shape*: Convex

*Across-slope shape*: Linear

*Aspect (representative)*: North

*Aspect range*: Northwest to northeast (clockwise)

*Slope range*: 2 to 8 percent

*Parent material*: Alluvium derived from granitoid

*Vegetation*: Branched pencil cholla, burrobush, Mojave yucca, pincushion flower, redstem stork's bill, big galleta, and creosote bush

#### Properties and Qualities

*Depth to restrictive feature*: None within a depth of 60 inches

*Shrink-swell potential*: Low (about 2.2 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: 1

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: Moderately high

*Natural drainage class*: Well drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Low (about 5.0 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7e

*Ecological site*: Very Rarely Flooded, Warm Thermic Fan Piedmonts (R030XB192CA)

*Hydric soil status*: No

*Hydrologic soil group*: B

#### Typical Profile

A—0 to 1 inch; sandy loam

Bt1—1 to 12 inches; gravelly sandy clay loam

Bt2—12 to 26 inches; gravelly sandy loam

BCt—26 to 33 inches; gravelly loamy sand

C—33 to 59 inches; gravelly sand

#### Minor Components

##### Morongo, occasionally flooded soils

*Percent of map unit*: 7 percent

*Slope*: 2 to 4 percent

*Landform*: Stream terraces

*Ecological site*: Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

##### Cronese, very rarely flooded soils

*Percent of map unit*: 3 percent

*Slope*: 2 to 8 percent

*Landform*: Fan remnants

*Ecological site*: Very Rarely Flooded, Warm Thermic Fan Piedmonts (R030XB192CA)

**Morongo, rarely flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Drainageways

*Ecological site:* Rarely Flooded Warm Thermic Ephemeral System (R030XY187CA)

**Morongo, frequently flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Active channels

*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

**3684—Morongo loamy sand, 4 to 8 percent slopes, warm**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,280 to 4,180 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

**Map Unit Composition**

Morongo, warm and similar soils: 85 percent

Dissimilar minor components: 15 percent

**Description of Morongo, Warm Soil**

**Classification**

Mixed, thermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* East

*Aspect range:* Northeast to southeast (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, big galleta, desertsenna, jojoba, and Mojave indigobush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Very Rarely Flooded, Warm Thermic Fan Piedmonts (R030XB192CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; loamy sand

AC—1 to 5 inches; gravelly loamy sand

C1—5 to 16 inches; gravelly sand

C2—16 to 79 inches; gravelly coarse sand

**Minor Components**

**Morongo, rarely flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Drainageways

*Ecological site:* Rarely Flooded Warm Thermic Ephemeral System (R030XY187CA)

**Nasagold, warm soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 8 percent

*Landform:* Fan aprons

*Ecological site:* Very Rarely Flooded, Warm Thermic Fan Piedmonts (R030XB192CA)

**Pinecity, moist soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 8 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Cool Shallow Fans Over Pediment (R030XB188CA)

**3685—Morongo-Desertqueen complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,280 to 4,920 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 270 days

**Map Unit Composition**

Morongo, cool and similar soils: 65 percent

Desertqueen, undulating and similar soils: 15 percent

Dissimilar minor components: 20 percent

**Description of Morongo, Cool Soil**

**Classification**

Mixed, thermic Typic Torripsamments

**Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 8 to 15 percent

*Parent material:* Alluvium derived from gneiss and/or alluvium derived from granitoid

*Vegetation:* Cheatgrass, blackbrush, and desert bitterbrush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; sand

BA—2 to 6 inches; sand

Bw—6 to 19 inches; loamy sand

C—19 to 59 inches; loamy sand

**Description of Desertqueen, Undulating Soil**

**Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplargids

**Setting**

*Landform:* Fan remnants on pediments

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northwest

*Aspect range:* West to northeast (clockwise)

*Slope range:* 8 to 30 percent

*Parent material:* Colluvium derived from gneiss and/or residuum weathered from gneiss

*Vegetation:* Blackbrush, red brome, and rubber rabbitbrush

**Properties and Qualities**

*Depth to restrictive feature:* 8 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 1.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 3 inches; loamy sand

Bt—3 to 12 inches; gravelly sandy loam

Crt—12 to 59 inches; bedrock

**Minor Components**

**Morongo, very rarely flooded soils**

*Percent of map unit:* 8 percent

*Slope:* 4 to 8 percent

*Landform:* Stream terraces and inset fans

*Ecological site:* Very Rarely To Rarely Flooded Thermic Ephemeral Stream  
(R030XY202CA)

**Jumborox soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Fan remnants

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

**Urban land**

*Percent of map unit:* 3 percent

**Morongo, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 8 percent

*Landform:* Channels

*Ecological site:* Very Rarely To Rarely Flooded Thermic Ephemeral Stream  
(R030XY202CA)

**Pinecity soils**

*Percent of map unit:* 2 percent

*Slope:* 8 to 30 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

## **3690—Nasagold gravelly loamy sand, 2 to 4 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 4,375 to 4,525 feet  
*Mean annual precipitation:* 4 to 7 inches  
*Mean annual air temperature:* 55 to 68 degrees F  
*Frost-free period:* 210 to 320 days

### **Map Unit Composition**

Nasagold and similar soils: 85 percent  
Dissimilar minor components: 15 percent

### **Description of Nasagold Soil**

#### **Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplocambids

#### **Setting**

*Landform:* Fan aprons  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* East  
*Aspect range:* Northwest to southwest (clockwise)  
*Slope range:* 2 to 4 percent  
*Parent material:* Alluvium derived from granite and gneiss  
*Vegetation:* Water jacket, bristly fiddleneck, big galleta, redstem stork's bill, creosote bush, and peach thorn

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Moderate (about 6.4 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Coarse Loamy Very Deep Fan Remnants (R030XB173CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A



**Typical Profile**

A—0 to 1 inch; gravelly loamy sand  
AB—1 to 6 inches; gravelly sandy loam  
Bw1—6 to 20 inches; gravelly sandy loam  
Bw2—20 to 37 inches; gravelly sandy loam  
C—37 to 59 inches; gravelly sandy loam

**Minor Components**

**Jumborox, warm soils**

*Percent of map unit:* 8 percent  
*Slope:* 2 to 4 percent  
*Landform:* Fan remnants  
*Ecological site:* Loamy Very Deep Fan Remnants (R030XB183CA)

**Yander soils**

*Percent of map unit:* 5 percent  
*Slope:* 2 to 4 percent  
*Landform:* Fan aprons on pediments  
*Ecological site:* Loamy Very Deep Fan Remnants (R030XB183CA)

**Morongo, rarely flooded soils**

*Percent of map unit:* 1 percent  
*Slope:* 2 to 4 percent  
*Landform:* Inset fans  
*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Morongo, frequently flooded soils**

*Percent of map unit:* 1 percent  
*Slope:* 2 to 4 percent  
*Landform:* Active channels  
*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

**3695—Gocougs loamy coarse sand, 2 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 2,935 to 3,590 feet  
*Mean annual precipitation:* 4 to 7 inches  
*Mean annual air temperature:* 63 to 68 degrees F  
*Frost-free period:* 280 to 320 days

**Map Unit Composition**

Gocougs and similar soils: 80 percent  
Dissimilar minor components: 20 percent

**Description of Gocougs Soil**

**Classification**

Fine-loamy, mixed, superactive, thermic Argic Petrocalcids

**Setting**

*Landform:* Fan aprons on fan remnants  
*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* West

*Aspect range:* Southwest to northwest (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Bristly fiddleneck, red brome, burrobush, chia, and redstem stork's bill

### **Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to petrocalcic horizon

*Shrink-swell potential:* Low (about 2.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 11

### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.2 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Moderately Deep To Very Deep Loamy Fan Remnants  
(R030XB218CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

### **Typical Profile**

A—0 to 2 inches; loamy coarse sand

Bw—2 to 6 inches; sand

Btk—6 to 33 inches; gravelly loam

Bkkm—33 to 46 inches; cemented gravelly sandy loam

Ckq—46 to 65 inches; gravelly coarse sand

### **Minor Components**

#### **Popups, very rarely flooded soils**

*Percent of map unit:* 10 percent

*Slope:* 2 to 8 percent

*Landform:* Fan aprons on fan remnants

*Ecological site:* Moderately Deep To Very Deep Loamy Fan Remnants  
(R030XB218CA)

#### **Jetmine, very rarely flooded soils**

*Percent of map unit:* 9 percent

*Slope:* 4 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Warm Sloping Pediments (R030XB225CA)

#### **Rock outcrop**

*Percent of map unit:* 1 percent

*Slope:* 2 to 30 percent

## **4031—Crosgrain-Crackerjack-Pinkcan complex, 4 to 30 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 3,065 to 3,655 feet  
*Mean annual precipitation:* 4 to 7 inches  
*Mean annual air temperature:* 55 to 68 degrees F  
*Frost-free period:* 210 to 320 days

### **Map Unit Composition**

Crosgrain and similar soils: 50 percent  
Crackerjack and similar soils: 30 percent  
Pinkcan, dry and similar soils: 15 percent  
Dissimilar minor components: 5 percent

### **Description of Crosgrain Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, thermic, shallow Typic Haplodurids

#### **Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Aspect (representative):* Southeast  
*Aspect range:* North to southwest (clockwise)  
*Slope range:* 8 to 30 percent  
*Parent material:* Alluvium derived from igneous rock  
*Vegetation:* Burrobush, creosote bush, and other shrubs

#### **Properties and Qualities**

*Depth to restrictive feature:* 6 to 14 inches to indurated duripan  
*Shrink-swell potential:* Low (about 0.6 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 3

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Very low  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.2 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Limy 5-7" p.z. (Low Production) (R030XB156CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

#### **Typical Profile**

A—0 to 1 inch; gravelly sandy loam

Bk1—1 to 6 inches; very gravelly sandy loam  
Bk2—6 to 13 inches; very gravelly sandy loam  
Bkqm—13 to 22 inches; cemented material

### Description of Crackerjack Soil

#### Classification

Loamy, mixed, superactive, thermic, shallow Cambidic Haplodurids

#### Setting

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* Southeast  
*Aspect range:* North to southwest (clockwise)  
*Slope range:* 8 to 30 percent  
*Parent material:* Alluvium derived from igneous rock  
*Vegetation:* Creosote bush and curvenut combseed

#### Properties and Qualities

*Depth to restrictive feature:* 10 to 14 inches to weakly cemented duripan  
*Shrink-swell potential:* Low (about 0.7 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 5

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Low  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.3 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Limy Hill 3-5" P.Z. (R030XB139CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

#### Typical Profile

A1—0 to 1 inch; gravelly sandy loam  
A2—1 to 7 inches; gravelly loam  
Bkq—7 to 13 inches; gravelly sandy loam  
Bkqm—13 to 59 inches; cemented very gravelly sandy loam

### Description of Pinkcan, Dry Soil

#### Classification

Fine-loamy, mixed, superactive, thermic Duric Petroargids

#### Setting

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluvium  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex

*Aspect (representative):* Southeast  
*Aspect range:* North to southwest (clockwise)  
*Slope range:* 4 to 8 percent  
*Parent material:* Alluvium derived from igneous rock  
*Vegetation:* Curvenut combseed and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* 39 to 59 inches to moderately cemented duripan  
*Shrink-swell potential:* Low (about 2.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 5.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Limy 5-7" p.z. (Low Production) (R030XB156CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* B

**Typical Profile**

A—0 to 0.5 inch; sandy loam  
Bt1—0.5 inch to 11 inches; sandy loam  
Bt2—11 to 19 inches; sandy clay loam  
Btk—19 to 25 inches; loam  
BC—25 to 28 inches; sandy loam  
C—28 to 33 inches; gravelly sandy loam  
2Bt—33 to 47 inches; gravelly sandy loam  
2Bkqm—47 to 60 inches; cemented loamy sand

**Minor Components**

**Crosgrain, steep soils**

*Percent of map unit:* 5 percent  
*Slope:* 30 to 50 percent  
*Landform:* Fan remnants  
*Ecological site:* Limy Hill 3-5" P.Z. (R030XB139CA)

**4041—Silvermine-Helendale-Burntshack association, 1 to 15 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 3,100 to 3,850 feet  
*Mean annual precipitation:* 4 to 7 inches  
*Mean annual air temperature:* 63 to 68 degrees F  
*Frost-free period:* 270 to 320 days

### Map Unit Composition

Silvermine and similar soils: 40 percent  
Helendale and similar soils: 30 percent  
Burntshack, very rarely flooded and similar soils: 20 percent  
Dissimilar minor components: 10 percent

### Description of Silvermine Soil

#### Classification

Sandy, mixed, thermic, shallow Cambidic Haplodurids

#### Setting

*Landform*: Fan remnants  
*Landform position (two-dimensional)*: Summit  
*Landform position (three-dimensional)*: Side slope  
*Down-slope shape*: Convex  
*Across-slope shape*: Concave  
*Aspect (representative)*: East  
*Aspect range*: North to southeast (clockwise)  
*Slope range*: 8 to 15 percent  
*Parent material*: Alluvium derived from granitoid and/or gneiss  
*Vegetation*: Creosote bush, burrobush, white ratany, Mojave yucca, and desert pepperweed

#### Properties and Qualities

*Depth to restrictive feature*: 6 to 14 inches to weakly cemented duripan  
*Shrink-swell potential*: Low (about 0.7 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: 12

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: Moderately low  
*Natural drainage class*: Somewhat excessively drained  
*Flooding frequency*: None  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Very low (about 0.4 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7e  
*Ecological site*: Limy Hill 5-7" p.z. (R030XB140CA)  
*Hydric soil status*: No  
*Hydrologic soil group*: D

#### Typical Profile

A—0 to 1 inch; loamy sand  
AB—1 to 7 inches; gravelly loamy sand  
Bkq—7 to 55 inches; cemented gravelly loamy sand  
Bq—55 to 59 inches; loamy sand

### Description of Helendale Soil

#### Classification

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

#### Setting

*Landform*: Fan remnants  
*Landform position (two-dimensional)*: Shoulder

*Landform position (three-dimensional):* Crest  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* East  
*Aspect range:* North to southeast (clockwise)  
*Slope range:* 4 to 8 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Burrobush and creosote bush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 1.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 4.8 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 2 inches; sandy loam  
Bt—2 to 16 inches; sandy loam  
C—16 to 59 inches; gravelly sand

**Description of Burntshack, Very Rarely Flooded Soil**

**Classification**

Loamy, mixed, superactive, thermic Arenic Haplargids

**Setting**

*Landform:* Fan aprons on fan remnants  
*Landform position (two-dimensional):* Summit and toeslope  
*Landform position (three-dimensional):* Side slope and tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* East  
*Aspect range:* North to southeast (clockwise)  
*Slope range:* 1 to 4 percent  
*Parent material:* Alluvium derived from granitoid and/or gneiss  
*Vegetation:* Big galleta, creosote bush, and Indian ricegrass

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 1.0 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates



### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* Very rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.8 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Sandy Plain 3-5" P.Z. (R030XB148CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 2 inches; sand

C—2 to 31 inches; loamy sand

2Bt1—31 to 43 inches; sandy loam

2Bt2—43 to 51 inches; sandy loam

2Bt3—51 to 59 inches; sandy loam

### Minor Components

#### Cajon soils

*Percent of map unit:* 6 percent

*Slope:* 2 to 8 percent

*Landform:* Fan aprons

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

#### Arizo, occasionally flooded soils

*Percent of map unit:* 4 percent

*Slope:* 2 to 8 percent

*Landform:* Inset fans

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

## 4064—Gravesumit-Helendale complex, 1 to 4 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,965 to 3,135 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

### Map Unit Composition

Gravesumit and similar soils: 55 percent

Helendale, sandy surface and similar soils: 35 percent

Dissimilar minor components: 10 percent

### Description of Gravesumit Soil

#### Classification

Coarse-loamy, mixed, superactive, thermic Typic Calciargids

**Setting**

*Landform:* Fan aprons on fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* All aspects

*Slope range:* 1 to 4 percent

*Parent material:* Alluvium derived from igneous rock

*Vegetation:* Creosote bush, big galleta, bristly fiddleneck, white ratany, and redstem stork's bill

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 7

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.9 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Granitic Loam (R030XB137CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; loamy fine sand

Bw—1 to 7 inches; loamy fine sand

Bt—7 to 13 inches; fine sandy loam

Btk—13 to 29 inches; fine sandy loam

C—29 to 41 inches; very gravelly coarse sand

2Btk—41 to 45 inches; sandy loam

2C—45 to 60 inches; gravelly coarse sand

**Description of Helendale, Sandy Surface Soil**

**Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* All aspects

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*Slope range:* 1 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush, big galleta, bristly fiddleneck, white ratany, and redstem stork's bill

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Moderate (about 6.1 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Granitic Loam (R030XB137CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 10 inches; loamy sand

Bt1—10 to 37 inches; sandy loam

Bt2—37 to 59 inches; sandy loam

### Minor Components

#### Cajon, occasionally flooded soils

*Percent of map unit:* 3 percent

*Slope:* 1 to 4 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)

#### Gocougs soils

*Percent of map unit:* 3 percent

*Slope:* 1 to 4 percent

*Landform:* Fan aprons on fan remnants

*Ecological site:* Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)

#### Cajon soils

*Percent of map unit:* 2 percent

*Slope:* 1 to 4 percent

*Landform:* Fan aprons

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

#### Hypoint soils

*Percent of map unit:* 2 percent

*Slope:* 1 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Gravelly Outwash (R030XY159CA)

## **4071—Helendale-Desertqueen association, 4 to 15 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 3,195 to 4,000 feet  
*Mean annual precipitation:* 4 to 7 inches  
*Mean annual air temperature:* 55 to 68 degrees F  
*Frost-free period:* 210 to 320 days

### **Map Unit Composition**

Helendale and similar soils: 65 percent  
Desertqueen, very rarely flooded and similar soils: 15 percent  
Dissimilar minor components: 20 percent

### **Description of Helendale Soil**

#### **Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

#### **Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Shoulder  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* Northeast  
*Aspect range:* Northwest to east (clockwise)  
*Slope range:* 4 to 15 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Burrobush and creosote bush

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 1.5 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Moderate (about 6.5 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 4 inches; sandy loam

Bt1—4 to 37 inches; sandy loam

Bt2—37 to 59 inches; sandy loam

### **Description of Desertqueen, Very Rarely Flooded Soil**

#### **Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplargids

#### **Setting**

*Landform:* Low hills

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss

*Vegetation:* Creosote bush, bristly fiddleneck, Mojave yucca, blackbrush, burrobrush, Great Basin langloisia, redstem stork's bill, and littleleaf ratany

#### **Properties and Qualities**

*Depth to restrictive feature:* 8 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 1.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.2 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Cool Shallow Fans Over Pediment (R030XB188CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

A—0 to 2 inches; sandy loam

Bt1—2 to 5 inches; gravelly sandy loam

Bt2—5 to 12 inches; coarse sandy loam

BCt—12 to 14 inches; extremely gravelly loamy coarse sand

Crt—14 to 59 inches; bedrock

### **Minor Components**

#### **Rock outcrop**

*Percent of map unit:* 7 percent

*Slope:* 4 to 15 percent

#### **Morongo, occasionally flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 15 percent

*Landform:* Narrow drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Pinecity soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

**Morongo, rarely flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 4 to 15 percent

*Landform:* Narrow drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

## **4091—Littlefargo-Rock outcrop association, 4 to 15 percent slopes**

### **Map Unit Setting**

*Landscape:* Hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 4,000 to 5,200 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 270 days

### **Map Unit Composition**

Littlefargo and similar soils: 85 percent

Rock outcrop: 10 percent

Dissimilar minor components: 5 percent

### **Description of Littlefargo Soil**

#### **Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

#### **Setting**

*Landform:* Pediments and hills

*Landform position (two-dimensional):* Summit and backslope

*Landform position (three-dimensional):* Nose slope and side slope

*Down-slope shape:* Linear and convex

*Across-slope shape:* Linear and convex

*Aspect (representative):* East

*Aspect range:* Northwest to south (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Muller oak, blackbrush, Eastern Mojave buckwheat, red brome, and pincushion flower

#### **Properties and Qualities**

*Depth to restrictive feature:* 20 to 39 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.7 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.7 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A1—0 to 1 inch; loamy sand

A2—1 to 4 inches; sandy loam

Bt—4 to 31 inches; sandy loam

BCt—31 to 34 inches; sandy loam

Cr—34 to 59 inches; bedrock

**Description of Rock Outcrop**

**Setting**

*Landform:* Hills and pediments

*Aspect:* All aspects

*Slope range:* 2 to 30 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

**Minor Components**

**Pinecity soils**

*Percent of map unit:* 3 percent

*Slope:* 4 to 15 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

**Morongo, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

**4245—Bluecut-Morongo-Yander association, 2 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,950 to 4,295 feet

*Mean annual precipitation:* 4 to 7 inches



*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

### Map Unit Composition

Bluecut and similar soils: 40 percent

Morongo, very rarely flooded and similar soils: 25 percent

Yander, very rarely flooded and similar soils: 15 percent

Dissimilar minor components: 20 percent

### Description of Bluecut Soil

#### Classification

Fine-loamy, mixed, superactive, thermic Typic Paleargids

#### Setting

*Landform:* Fan aprons on fan remnants

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Northeast

*Aspect range:* Northwest to southeast (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granite and gneiss

*Vegetation:* Blackbrush, creosote bush, pincushion flower, burrobush, big galleta, Mojave yucca, and redstem stork's bill

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 2.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Moderate (about 6.0 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Loamy Very Deep Fan Remnants (R030XB183CA)

*Hydric soil status:* No

*Hydrologic soil group:* B

#### Typical Profile

A—0 to 4 inches; loamy sand

Bt—4 to 11 inches; loamy coarse sand

2Bt1—11 to 21 inches; sandy clay loam

2Bt2—21 to 26 inches; sandy loam

2BCt—26 to 49 inches; very gravelly loamy coarse sand

2C—49 to 79 inches; loamy coarse sand

### Description of Morongo, Very Rarely Flooded Soil

#### Classification

Mixed, thermic Typic Torripsamments

#### Setting

*Landform*: Fan aprons

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Tread

*Down-slope shape*: Linear

*Across-slope shape*: Linear

*Aspect (representative)*: Northeast

*Aspect range*: Northwest to southeast (clockwise)

*Slope range*: 4 to 8 percent

*Parent material*: Alluvium derived from granite and gneiss

*Vegetation*: Big galleta, creosote bush, burrobush, burrobrush, Mojave yucca, and white ratany

#### Properties and Qualities

*Depth to restrictive feature*: None within a depth of 60 inches

*Shrink-swell potential*: Low (about 0.1 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Somewhat excessively drained

*Flooding frequency*: Very rare (see table 24)

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Low (about 3.2 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7s

*Ecological site*: Sandy Fan Aprons (R030XB174CA)

*Hydric soil status*: No

*Hydrologic soil group*: A

#### Typical Profile

A—0 to 1 inch; sand

Bw—1 to 6 inches; sand

C1—6 to 28 inches; sand

C2—28 to 59 inches; coarse sand

### Description of Yander, Very Rarely Flooded Soil

#### Classification

Mixed, thermic Typic Torripsamments

#### Setting

*Landform*: Fan aprons on pediments

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Tread

*Down-slope shape*: Linear

*Across-slope shape*: Linear

*Aspect (representative)*: Northeast

*Aspect range*: Northwest to southeast (clockwise)

## Soil Survey of Joshua Tree National Park, California

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granite and gneiss over residuum weathered from granite

*Vegetation:* Big galleta, creosote bush, burrobush, burrobrush, Mojave yucca, and white ratany

### Properties and Qualities

*Depth to restrictive feature:* 39 to 59 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Very rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.9 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Sandy Fan Aprons (R030XB174CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A—0 to 2 inches; loamy sand

Bw—2 to 23 inches; gravelly loamy sand

C—23 to 40 inches; gravelly coarse sand

Cr—40 to 79 inches; bedrock

## Minor Components

### Yander, warm, very rarely flooded soils

*Percent of map unit:* 10 percent

*Slope:* 8 to 15 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Very Rarely Flooded, Warm Thermic Fan Piedmonts (R030XB192CA)

### Jumborox, warm soils

*Percent of map unit:* 5 percent

*Slope:* 2 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Loamy Very Deep Fan Remnants (R030XB183CA)

### Morongo, rarely flooded soils

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Drainageways

*Ecological site:* Rarely Flooded Warm Thermic Ephemeral System (R030XY187CA)

### Morongo, frequently flooded soils

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Active channels

*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

## 4260—Minhoyt-Corbilt association, 2 to 8 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 2,230 to 3,410 feet  
*Mean annual precipitation:* 4 to 7 inches  
*Mean annual air temperature:* 63 to 68 degrees F  
*Frost-free period:* 270 to 320 days

### Map Unit Composition

Minhoyt and similar soils: 45 percent  
Corbilt, rarely flooded and similar soils: 40 percent  
Dissimilar minor components: 15 percent

### Description of Minhoyt Soil

#### Classification

Loamy, mixed, superactive, thermic, shallow Typic Haplodurids

#### Setting

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Crest  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* West  
*Aspect range:* Southwest to east (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid and/or gneiss  
*Vegetation:* Asian mustard, creosote bush, burrobrush, Nevada jointfir, Hall's shrubby-spurge, and curvenut combseed

#### Properties and Qualities

*Depth to restrictive feature:* 1 to 3 inches to moderately cemented duripan; 4 to 9 inches to strongly cemented duripan; 10 to 28 inches to very strongly cemented duripan  
*Shrink-swell potential:* Low (about 0.9 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 16

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Very low  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 0.2 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 8  
*Ecological site:* Very Shallow Duripan Fan Remnants (R030XB220CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

**Typical Profile**

Aq—0 to 1 inch; sandy loam  
Bkq1—1 to 2 inches; gravelly loamy coarse sand  
Bkq2—2 to 12 inches; cemented loamy coarse sand  
Bkqm—12 to 59 inches; cemented material

**Description of Corbilt, Rarely Flooded Soil**

**Classification**

Coarse-loamy, mixed, superactive, thermic Duric Haplocalcids

**Setting**

*Landform:* Fan aprons on fan remnants  
*Landform position (two-dimensional):* Footslope and toeslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear and concave  
*Aspect (representative):* Southwest  
*Aspect range:* South to east (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush, burrobush, Mojave yucca, jojoba, and redstem stork's bill

**Properties and Qualities**

*Depth to restrictive feature:* 39 to 61 inches to moderately cemented duripan  
*Shrink-swell potential:* Low (about 0.7 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 32

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low  
*Natural drainage class:* Well drained  
*Flooding frequency:* Very rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 5.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Moderately Deep To Very Deep Loamy Fan Remnants  
(R030XB218CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

Cq1—0 to 6 inches; sand  
Cq2—6 to 14 inches; sand  
2Bkq—14 to 51 inches; sandy loam  
2Bkqm—51 to 59 inches; cemented loamy sand

**Minor Components**

**Popups, cool soils**

*Percent of map unit:* 9 percent  
*Slope:* 2 to 8 percent  
*Landform:* Fan remnants  
*Ecological site:* Loamy Fan Remnants And Pediments (R030XB221CA)

**Minhoyt, sloping soils**

*Percent of map unit:* 5 percent

*Slope:* 15 to 50 percent

*Landform:* Fan remnants

*Ecological site:* Very Shallow Duripan Fan Remnants (R030XB220CA)

**Riverwash**

*Percent of map unit:* 1 percent

*Slope:* 2 to 50 percent

**4265—Werewolf gravelly sandy loam, 4 to 15 percent slopes**

**Map Unit Setting**

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,030 to 2,345 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Werewolf, warm and similar soils: 80 percent

Dissimilar minor components: 20 percent

**Description of Werewolf, Warm Soil**

**Classification**

Loamy-skeletal, mixed, superactive, thermic Typic Haplargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit and shoulder

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Convex

*Across-slope shape:* Linear and convex

*Aspect (representative):* North

*Aspect range:* West to east (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Creosote bush and burrobush

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated): 7e*

*Ecological site: LIMY 3-5 P.Z. (R030XB019NV)*

*Hydric soil status: No*

*Hydrologic soil group: B*

**Typical Profile**

A—0 to 2 inches; gravelly sandy loam

Bt1—2 to 19 inches; very gravelly sandy loam

Bt2—19 to 24 inches; extremely gravelly sandy loam

Btk—24 to 30 inches; very gravelly sandy loam

BC—30 to 59 inches; very gravelly loamy sand

**Minor Components**

**Werewolf soils**

*Percent of map unit: 7 percent*

*Slope: 15 to 30 percent*

*Landform: Fan remnants*

*Ecological site: LIMY 5-7 P.Z. (R030XB005NV)*

**Werewolf, warm, gently sloping soils**

*Percent of map unit: 5 percent*

*Slope: 2 to 4 percent*

*Landform: Fan remnants*

*Ecological site: LIMY 3-5 P.Z. (R030XB019NV)*

**Arizo, occasionally flooded soils**

*Percent of map unit: 5 percent*

*Slope: 2 to 4 percent*

*Landform: Drainageways*

*Ecological site: Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)*

**Arizo, rarely flooded soils**

*Percent of map unit: 3 percent*

*Slope: 4 to 8 percent*

*Landform: Inset fans*

*Ecological site: LIMY 5-7 P.Z. (R030XB005NV)*

**4270—Yuccabutte very gravelly loam, 8 to 50 percent slopes**

**Map Unit Setting**

*Major land resource area: 30—Mojave Desert*

*Elevation: 2,360 to 3,690 feet*

*Mean annual precipitation: 3 to 7 inches*

*Mean annual air temperature: 63 to 68 degrees F*

*Frost-free period: 270 to 320 days*

**Map Unit Composition**

Yuccabutte and similar soils: 95 percent

Dissimilar minor components: 5 percent



### Description of Yuccabutte Soil

#### Classification

Loamy-skeletal, mixed, superactive, thermic Typic Haplargids

#### Setting

*Landform:* Ballenas

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Head slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* Northeast to southwest (clockwise)

*Slope range:* 8 to 50 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Burrobush and Mojave yucca

#### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.8 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.1 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* C

#### Typical Profile

A—0 to 2 inches; very gravelly loam

Bt1—2 to 16 inches; extremely stony clay loam

Bt2—16 to 30 inches; extremely stony sandy clay loam

Bt3—30 to 39 inches; very gravelly sandy loam

Bt4—39 to 53 inches; sandy loam

C—53 to 60 inches; gravelly loamy sand

#### Minor Components

##### Cajon, occasionally flooded soils

*Percent of map unit:* 5 percent

*Slope:* 4 to 8 percent

*Landform:* Narrow drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

## **4271—Yuccabutte-Arizo association, 2 to 15 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 30—Mojave Desert  
*Elevation:* 2,605 to 3,360 feet  
*Mean annual precipitation:* 3 to 7 inches  
*Mean annual air temperature:* 63 to 68 degrees F  
*Frost-free period:* 270 to 320 days

### **Map Unit Composition**

Yuccabutte, warm and similar soils: 60 percent  
Arizo, rarely flooded and similar soils: 30 percent  
Dissimilar minor components: 10 percent

### **Description of Yuccabutte, Warm Soil**

#### **Classification**

Loamy-skeletal, mixed, superactive, thermic Typic Haplargids

#### **Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* Northeast  
*Aspect range:* Northwest to east (clockwise)  
*Slope range:* 4 to 15 percent  
*Parent material:* Alluvium derived from granitoid and/or gneiss  
*Vegetation:* Burrobush, creosote bush, white ratany, and Mojave yucca

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 2.7 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low  
*Natural drainage class:* Well drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 4.2 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e  
*Ecological site:* Limy 5-7" p.z. (Low Production) (R030XB156CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* C

#### **Typical Profile**

A—0 to 0.5 inch; loam  
Bt1—0.5 inch to 6 inches; gravelly clay loam  
Bt2—6 to 20 inches; very gravelly sandy clay loam

Bt3—20 to 39 inches; very gravelly sandy loam

Bt4—39 to 53 inches; sandy loam

C—53 to 60 inches; gravelly loamy sand

### **Description of Arizo, Rarely Flooded Soil**

#### **Classification**

Sandy-skeletal, mixed, thermic Typic Torriorthents

#### **Setting**

*Landform:* Inset fans

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Creosote bush and desertsenna

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.1 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Gravelly Outwash (R030XY159CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

#### **Typical Profile**

A—0 to 2 inches; gravelly loamy sand

Bw—2 to 15 inches; gravelly loamy sand

C—15 to 59 inches; very gravelly sand

### **Minor Components**

#### **Rock outcrop**

*Percent of map unit:* 5 percent

*Slope:* 2 to 30 percent

#### **Cajon, occasionally flooded soils**

*Percent of map unit:* 4 percent

*Slope:* 2 to 4 percent

*Landform:* Narrow drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Yuccabutte, steep soils**

*Percent of map unit:* 1 percent

*Slope:* 15 to 30 percent

*Landform:* Fan remnants

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

**4275—Pinkcan-Werewolf-Gocougs association, 2 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,410 to 3,825 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Pinkcan and similar soils: 35 percent

Werewolf and similar soils: 25 percent

Gocougs, warm and similar soils: 15 percent

Dissimilar minor components: 25 percent

**Description of Pinkcan Soil**

**Classification**

Fine-loamy, mixed, superactive, thermic Duric Petroargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Burrobush, creosote bush, peach thorn, and white ratany

**Properties and Qualities**

*Depth to restrictive feature:* 39 to 59 inches to weakly cemented duripan

*Shrink-swell potential:* Low (about 2.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 5.6 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

*Hydric soil status:* No

*Hydrologic soil group:* B

**Typical Profile**

A—0 to 1 inch; loam

Bt1—1 to 11 inches; sandy loam

Bt2—11 to 19 inches; sandy clay loam

Btk—19 to 25 inches; loam

BC—25 to 28 inches; sandy loam

C—28 to 33 inches; gravelly sandy loam

2Bt—33 to 47 inches; gravelly sandy loam

2Bkqm—47 to 60 inches; cemented loamy sand

**Description of Werewolf Soil**

**Classification**

Loamy-skeletal, mixed, superactive, thermic Typic Haplargids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Creosote bush, bristly fiddleneck, desertsenna, and pincushion flower

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.8 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; loamy sand

Bw—1 to 15 inches; sandy loam

Btk—15 to 31 inches; very gravelly sandy loam

Btkq1—31 to 41 inches; very gravelly sandy loam  
Btkq2—41 to 54 inches; gravelly loamy coarse sand  
2Btk—54 to 65 inches; sandy loam

### Description of Gocougs, Warm Soil

#### Classification

Fine-loamy, mixed, superactive, thermic Argic Petrocalcids

#### Setting

*Landform*: Fan remnants  
*Landform position (two-dimensional)*: Shoulder  
*Landform position (three-dimensional)*: Side slope  
*Down-slope shape*: Linear  
*Across-slope shape*: Convex  
*Aspect (representative)*: East  
*Aspect range*: North to southeast (clockwise)  
*Slope range*: 2 to 8 percent  
*Parent material*: Alluvium derived from granitoid  
*Vegetation*: Creosote bush and burrobush

#### Properties and Qualities

*Depth to restrictive feature*: 20 to 39 inches to petrocalcic horizon  
*Shrink-swell potential*: Moderate (about 4.5 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: 5

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: Low  
*Natural drainage class*: Well drained  
*Flooding frequency*: None  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Low (about 4.7 inches)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7e  
*Ecological site*: LIMY 5-7 P.Z. (R030XB005NV)  
*Hydric soil status*: No  
*Hydrologic soil group*: D

#### Typical Profile

A—0 to 1 inch; fine sandy loam  
Bt—1 to 8 inches; clay loam  
Btk—8 to 34 inches; gravelly sandy clay loam  
Bkk—34 to 39 inches; cemented very gravelly loamy sand

### Minor Components

#### Arizo, rarely flooded soils

*Percent of map unit*: 8 percent  
*Slope*: 2 to 8 percent  
*Landform*: Inset fans  
*Ecological site*: LIMY 5-7 P.Z. (R030XB005NV)

#### Yuccabutte, dry soils

*Percent of map unit*: 7 percent  
*Slope*: 8 to 30 percent

*Landform:* Fan remnants  
*Ecological site:* LIMY 3-5 P.Z. (R030XB019NV)

**Gocougs, stable soils**

*Percent of map unit:* 5 percent  
*Slope:* 2 to 8 percent  
*Landform:* Fan remnants  
*Ecological site:* Desert Pavement (R030XY002CA)

**Joshua soils**

*Percent of map unit:* 3 percent  
*Slope:* 4 to 8 percent  
*Landform:* Fan remnants  
*Ecological site:* Granitic Loam (R030XB137CA)

**Gravesumit soils**

*Percent of map unit:* 2 percent  
*Slope:* 2 to 4 percent  
*Landform:* Fan aprons on fan remnants  
*Ecological site:* Granitic Loam (R030XB137CA)

## **4280—Mekkadale-Edalph association, 4 to 30 percent slopes**

### **Map Unit Setting**

*Landscape:* Fan piedmonts  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 3,050 to 3,345 feet  
*Mean annual precipitation:* 4 to 7 inches  
*Mean annual air temperature:* 63 to 68 degrees F  
*Frost-free period:* 270 to 320 days

### **Map Unit Composition**

Mekkadale and similar soils: 55 percent  
Edalph, warm and similar soils: 25 percent  
Dissimilar minor components: 20 percent

### **Description of Mekkadale Soil**

#### **Classification**

Loamy, mixed, superactive, thermic, shallow Argidic Argidurids

#### **Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* South  
*Aspect range:* North to southwest (clockwise)  
*Slope range:* 4 to 30 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush, redstem stork's bill, and bristly fiddleneck

#### **Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to weakly cemented duripan



*Shrink-swell potential*: Moderate (about 3.0 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: 5

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ )*: Moderately low  
*Natural drainage class*: Well drained  
*Flooding frequency*: None  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Very low (about 2.6 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated)*: 7e  
*Ecological site*: Limy Hill 3-5" P.Z. (R030XB139CA)  
*Hydric soil status*: No  
*Hydrologic soil group*: D

#### **Typical Profile**

A—0 to 1 inch; loam  
Bt—1 to 12 inches; loam  
Btk—12 to 19 inches; sandy loam  
Bkq—19 to 26 inches; cemented loamy sand  
Ckq—26 to 59 inches; gravelly loamy sand

### **Description of Edalphy, Warm Soil**

#### **Classification**

Sandy, mixed, thermic Typic Haplocalcids

#### **Setting**

*Landform*: South-facing side slopes of fan remnants  
*Landform position (two-dimensional)*: Backslope  
*Landform position (three-dimensional)*: Side slope  
*Down-slope shape*: Linear  
*Across-slope shape*: Convex  
*Aspect (representative)*: South  
*Aspect range*: North to east (clockwise)  
*Slope range*: 15 to 30 percent  
*Parent material*: Alluvium derived from granitoid  
*Vegetation*: Creosote bush, redstem stork's bill, and bristly fiddleneck

#### **Properties and Qualities**

*Depth to restrictive feature*: None within a depth of 60 inches  
*Shrink-swell potential*: Low (about 0.9 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: 15

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ )*: High  
*Natural drainage class*: Well drained  
*Flooding frequency*: None  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Low (about 3.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated): 7e*  
*Ecological site: Limy Hill 3-5" P.Z. (R030XB139CA)*  
*Hydric soil status: No*  
*Hydrologic soil group: A*

**Typical Profile**

A—0 to 2 inches; gravelly sandy loam  
Bk1—2 to 15 inches; gravelly sandy loam  
Bk2—15 to 20 inches; sandy loam  
Bkk—20 to 31 inches; loamy coarse sand  
BCk—31 to 59 inches; gravelly loamy coarse sand

**Minor Components**

**Edalph soils**

*Percent of map unit: 10 percent*  
*Slope: 15 to 50 percent*  
*Landform: North-facing side slopes of fan remnants*  
*Ecological site: Limy Hill 5-7" p.z. (R030XB140CA)*

**Cajon, rarely flooded soils**

*Percent of map unit: 8 percent*  
*Slope: 4 to 8 percent*  
*Landform: Inset fans*  
*Ecological site: Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream (R030XY188CA)*

**Gocougs soils**

*Percent of map unit: 2 percent*  
*Slope: 4 to 8 percent*  
*Landform: Fan remnants*  
*Ecological site: Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)*

**4285—Typic Argidurids-Coppermine-Minhoyt complex, 4 to 30 percent slopes**

**Map Unit Setting**

*Landscape: Fan piedmonts*  
*Major land resource area: 30—Mojave Desert*  
*Elevation: 3,165 to 3,440 feet*  
*Mean annual precipitation: 4 to 7 inches*  
*Mean annual air temperature: 63 to 68 degrees F*  
*Frost-free period: 270 to 320 days*

**Map Unit Composition**

Typic Argidurids and similar soils: 35 percent  
Coppermine and similar soils: 30 percent  
Minhoyt, warm and similar soils: 25 percent  
Dissimilar minor components: 10 percent

**Description of Typic Argidurids**

**Classification**

Typic Argidurids

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 8 to 30 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Burrobush, creosote bush, redstem stork's bill, white ratany, and Mojave yucca

**Properties and Qualities**

*Depth to restrictive feature:* 23 inches to indurated duripan

*Shrink-swell potential:* Low (about 1.9 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Very low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 2.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

C—0 to 1 inch; extremely gravelly fine sandy loam

A—1 to 2 inches; fine sandy loam

Btq1—2 to 7 inches; gravelly loam

Btq2—7 to 18 inches; very gravelly clay loam

Btkq—18 to 23 inches; very gravelly loam

Bkqm—23 to 33 inches; cemented material

**Description of Coppermine Soil****Classification**

Loamy-skeletal, mixed, superactive, thermic Lithic Haplargids

**Setting**

*Landform:* Pediments

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 8 to 30 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

## Soil Survey of Joshua Tree National Park, California

*Vegetation:* Spineflower, desert Indianwheat, creosote bush, Engelmann's hedgehog cactus, and Mediterranean grass

### Properties and Qualities

*Depth to restrictive feature:* 5 to 14 inches to lithic bedrock

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.8 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 3-5" P.Z. (R030XB139CA)

*Hydric soil status:* No

*Hydrologic soil group:* B

### Typical Profile

A—0 to 1 inch; fine sandy loam

Bt1—1 to 8 inches; very gravelly sandy loam

Bt2—8 to 11 inches; extremely gravelly sandy clay loam

R—11 to 21 inches; bedrock

## Description of Minhoyt, Warm Soil

### Classification

Loamy, mixed, superactive, thermic, shallow Typic Haplodurids

### Setting

*Landform:* Fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear and convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Creosote bush, white ratany, burrobush, desert Indianwheat, curvenut combseed, redstem stork's bill, and smooth desertdandelion

### Properties and Qualities

*Depth to restrictive feature:* 1 to 7 inches to very strongly cemented duripan

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 15

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Very low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; fine sandy loam

Bkq—1 to 7 inches; loam

Bkqm—7 to 59 inches; cemented material

**Minor Components**

**Rock outcrop**

*Percent of map unit:* 5 percent

*Slope:* 2 to 50 percent

**Typic Argidurids, steep**

*Percent of map unit:* 4 percent

*Slope:* 30 to 50 percent

*Landform:* Fan remnants

*Ecological site:* Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)

**Arizo, occasionally flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 8 percent

*Landform:* Drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**4403—Arizo complex, 2 to 8 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,915 to 3,260 feet

*Mean annual precipitation:* 5 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Arizo, rarely flooded, channeled and similar soils: 50 percent

Arizo, rarely flooded and similar soils: 25 percent

Arizo and similar soils: 20 percent

Dissimilar minor components: 5 percent

**Description of Arizo, Rarely Flooded, Channeled Soil**

**Classification**

Sandy-skeletal, mixed, thermic Typic Torriorthents

**Setting**

*Landform:* Lower part of alluvial fans

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* Southwest  
*Aspect range:* East to west (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid and/or gneiss  
*Vegetation:* Curvenut combseed, creosote bush, and smooth desertdandelion

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Excessively drained  
*Flooding frequency:* Rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 1.4 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* Flooded Gravelly Fans (R030XY038CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

C1—0 to 6 inches; gravelly sand  
C2—6 to 59 inches; extremely gravelly coarse sand

**Description of Arizo, Rarely Flooded Soil**

**Classification**

Sandy-skeletal, mixed, thermic Typic Torriorthents

**Setting**

*Landform:* Drainageways  
*Landform position (two-dimensional):* Shoulder  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave  
*Aspect (representative):* Southwest  
*Aspect range:* East to west (clockwise)  
*Slope range:* 2 to 8 percent  
*Parent material:* Alluvium derived from granitoid and/or gneiss  
*Vegetation:* Sweetbush, burrobrush, creosote bush, pincushion, and catclaw acacia

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.0 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* Rare (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.4 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

C1—0 to 6 inches; gravelly sand

C2—6 to 59 inches; extremely gravelly coarse sand

## Description of Arizo Soil

### Classification

Sandy-skeletal, mixed, thermic Typic Torriorthents

### Setting

*Landform:* Upper part of alluvial fans

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* South

*Aspect range:* East to west (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or gneiss

*Vegetation:* Curvenut combseed and creosote bush

### Properties and Qualities

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.5 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)

*Hydric soil status:* No

*Hydrologic soil group:* B



**Typical Profile**

A—0 to 4 inches; sandy loam

C—4 to 59 inches; extremely gravelly coarse sand

**Minor Components**

**Werewolf, stable soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Desert Pavement (R030XY002CA)

**4440—Dragonwash association, 2 to 4 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,130 to 3,060 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Dragonwash, occasionally flooded and similar soils: 55 percent

Dragonwash, frequently flooded and similar soils: 35 percent

Dissimilar minor components: 10 percent

**Description of Dragonwash, Occasionally Flooded Soil**

**Classification**

Sandy-skeletal, mixed, thermic Typic Torriorthents

**Setting**

*Landform:* Bars of drainageways

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from igneous and metamorphic rock

*Vegetation:* Curvenut combseed, creosote bush, western tansymustard, and redstem stork's bill

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.1 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly loamy sand

C1—1 to 5 inches; sand

C2—5 to 59 inches; very gravelly sand

**Description of Dragonwash, Frequently Flooded Soil**

**Classification**

Sandy-skeletal, mixed, thermic Typic Torriorthents

**Setting**

*Landform:* Active drainageways

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from igneous and metamorphic rock

*Vegetation:* Desert willow, bladderpod spiderflower, smoketree, and American  
threefold

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.0 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Frequent (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 4.1 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic  
Ephemeral Stream (R030XY010CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; gravelly sand

C1—1 to 10 inches; very gravelly sand and gravelly sand

C2—10 to 59 inches; very gravelly sand

### Minor Components

#### **Cajon, rarely flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Inset fans

*Ecological site:* Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream  
(R030XY188CA)

#### **Riverwash**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

## **4450—Morongo association, 2 to 4 percent slopes**

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,355 to 3,745 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

### Map Unit Composition

Morongo, occasionally flooded and similar soils: 75 percent

Morongo, frequently flooded and similar soils: 15 percent

Dissimilar minor components: 10 percent

### Description of Morongo, Occasionally Flooded Soil

#### **Classification**

Mixed, thermic Typic Torripsamments

#### **Setting**

*Landform:* Drainageways

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Peach thorn, catclaw acacia, and bristly fiddleneck

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Occasional (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A—0 to 6 inches; sand

C1—6 to 18 inches; gravelly coarse sand

C2—18 to 60 inches; sand

**Description of Morongo, Frequently Flooded Soil**

**Classification**

Mixed, thermic Typic Torripsamments

**Setting**

*Landform:* Active channels

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* North

*Aspect range:* Northwest to northeast (clockwise)

*Slope range:* 2 to 4 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Desert willow

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 1.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* Frequent (see table 24)

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 3.0 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

**Typical Profile**

A1—0 to 2 inches; sand

A2—2 to 7 inches; gravelly sand

C—7 to 60 inches; gravelly coarse sand

### Minor Components

#### **Morongo, rarely flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Inset fans

*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

#### **Morongo, very rarely flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Lower fan aprons

*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

#### **Riverwash**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

## **4605—Pinecity loamy sand, 2 to 8 percent slopes**

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,710 to 4,625 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

### Map Unit Composition

Pinecity, moist and similar soils: 80 percent

Dissimilar minor components: 20 percent

### Description of Pinecity, Moist Soil

#### **Classification**

Mixed, thermic, shallow Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons on pediments

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* Northeast to south (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Alluvium and/or colluvium derived from granite or granitoid over residuum weathered from granite and/or granitoid

*Vegetation:* Creosote bush, blackbrush, Eastern Mojave buckwheat, Mojave yucca, white ratany, Acton's brittlebush, and Mexican bladdersage

#### **Properties and Qualities**

*Depth to restrictive feature:* 2 to 8 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.6 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Cool Shallow Fans Over Pediment (R030XB188CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; loamy sand

Bw—1 to 8 inches; loamy sand

Crt—8 to 59 inches; bedrock

**Minor Components**

**Rock outcrop**

*Percent of map unit:* 10 percent

*Slope:* 2 to 15 percent

**Nasagold soils**

*Percent of map unit:* 4 percent

*Slope:* 2 to 8 percent

*Landform:* Fan aprons

*Ecological site:* Coarse Loamy Very Deep Fan Remnants (R030XB173CA)

**Jumborox, dry soils**

*Percent of map unit:* 3 percent

*Slope:* 2 to 4 percent

*Landform:* Fan remnants

*Ecological site:* Loamy Very Deep Fan Remnants (R030XB183CA)

**Morongo, very rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Sandy Fan Aprons (R030XB174CA)

**Morongo, occasionally flooded soils**

*Percent of map unit:* 1 percent

*Slope:* 2 to 4 percent

*Landform:* Narrow inset fans

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**4606—Pinecity-Rock outcrop association, 4 to 15 percent slopes**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,605 to 4,650 feet

## Soil Survey of Joshua Tree National Park, California

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 320 days

### Map Unit Composition

Pinecity and similar soils: 60 percent

Rock outcrop: 25 percent

Dissimilar minor components: 15 percent

### Description of Pinecity Soil

#### Classification

Mixed, thermic, shallow Typic Torripsamments

#### Setting

*Landform:* Fan aprons on pediments

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope and tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear and convex

*Aspect (representative):* South

*Aspect range:* West to east (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from granite over residuum weathered from granite

*Vegetation:* Eastern Mojave buckwheat, Mojave yucca, Nevada jointfir, pincushion flower, and shrubby deervetch

#### Properties and Qualities

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### Typical Profile

A—0 to 1 inch; gravelly loamy sand

Bw—1 to 6 inches; gravelly loamy sand

Cr—6 to 59 inches; bedrock

### Description of Rock Outcrop

#### Setting

*Landform:* Pediments

*Aspect:* All aspects



*Slope range:* 2 to 30 percent

*Definition:* Areas of exposed granite rocks without a soil mantle

#### **Minor Components**

##### **Desertqueen, cool soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 8 percent

*Landform:* Fan remnants on pediments

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

##### **Jumborox, warm soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 8 percent

*Landform:* Fan remnants

*Ecological site:* Coarse Loamy Very Deep Fan Remnants (R030XB173CA)

##### **Morongo, very rarely flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Sandy Fan Aprons (R030XB174CA)

## **4607—Pinecity sand, 4 to 8 percent slopes**

#### **Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,850 to 4,445 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 270 days

#### **Map Unit Composition**

Pinecity and similar soils: 85 percent

Dissimilar minor components: 15 percent

#### **Description of Pinecity Soil**

##### **Classification**

Mixed, thermic, shallow Typic Torripsamments

##### **Setting**

*Landform:* Fan aprons on pediments

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Eastern Mojave buckwheat, Mojave yucca, Nevada jointfir, pincushion flower, and shrubby deervetch

**Properties and Qualities**

*Depth to restrictive feature:* 2 to 8 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 1.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 2 inches; sand

Bw—2 to 6 inches; sand

Crt—6 to 59 inches; bedrock

**Minor Components**

**Morongo, very rarely flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 8 percent

*Landform:* Channels

*Ecological site:* Sandy Fan Aprons (R030XB174CA)

**Pinecity, sloping soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

**Rock outcrop**

*Percent of map unit:* 5 percent

*Slope:* 4 to 15 percent

**4608—Pinecity-Rock outcrop association, 4 to 15 percent slopes, high elevation**

**Map Unit Setting**

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 4,230 to 5,180 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 270 days

### Map Unit Composition

Pinecity and similar soils: 60 percent  
Rock outcrop: 30 percent  
Dissimilar minor components: 10 percent

### Description of Pinecity Soil

#### Classification

Mixed, thermic, shallow Typic Torripsamments

#### Setting

*Landform*: Fan aprons on pediments  
*Landform position (two-dimensional)*: Shoulder and backslope  
*Landform position (three-dimensional)*: Side slope and tread  
*Down-slope shape*: Linear and convex  
*Across-slope shape*: Convex  
*Aspect (representative)*: North  
*Aspect range*: Northwest to northeast (clockwise)  
*Slope range*: 4 to 15 percent  
*Parent material*: Alluvium derived from granitoid over residuum weathered from granitoid  
*Vegetation*: Blackbrush, Eastern Mojave buckwheat, and goldenbush

#### Properties and Qualities

*Depth to restrictive feature*: 2 to 10 inches to paralithic bedrock  
*Shrink-swell potential*: Low (about 0.4 LEP)  
*Salinity maximum based on representative value*: Nonsaline  
*Sodicity maximum*: Not sodic  
*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High  
*Natural drainage class*: Somewhat excessively drained  
*Flooding frequency*: None  
*Ponding frequency*: None  
*Depth to seasonal water table*: Not present within a depth of 72 inches  
*Available water capacity (entire profile)*: Very low (about 0.4 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 7e  
*Ecological site*: Dissected Pediment, Cool (R030XB166CA)  
*Hydric soil status*: No  
*Hydrologic soil group*: D

#### Typical Profile

A—0 to 2 inches; loamy sand  
C—2 to 5 inches; loamy sand  
Crt—5 to 59 inches; bedrock

### Description of Rock Outcrop

#### Setting

*Landform*: Pediments  
*Aspect*: All aspects  
*Slope range*: 2 to 30 percent  
*Definition*: Areas of exposed granitoid rocks without a soil mantle

### Minor Components

#### **Morongo, rarely flooded soils**

*Percent of map unit:* 10 percent

*Slope:* 2 to 4 percent

*Landform:* Fan aprons

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

## **4610—Desertqueen-Jumborox-Rock outcrop association, 2 to 8 percent slopes, warm**

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 3,690 to 5,165 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

### Map Unit Composition

Desertqueen and similar soils: 35 percent

Jumborox, warm and similar soils: 25 percent

Rock outcrop: 20 percent

Dissimilar minor components: 20 percent

### Description of Desertqueen Soil

#### **Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplargids

#### **Setting**

*Landform:* Flat summits of pediments

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 2 to 8 percent

*Parent material:* Residuum weathered from granite

*Vegetation:* Creosote bush, bristly fiddleneck, Mojave yucca, blackbrush, burrobrush,  
Great Basin langloisia, redstem stork's bill, and littleleaf ratany

#### **Properties and Qualities**

*Depth to restrictive feature:* 9 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 1.6 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

## Soil Survey of Joshua Tree National Park, California

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.2 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Cool Shallow Fans Over Pediment (R030XB188CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### **Typical Profile**

A—0 to 2 inches; sandy loam

Bt1—2 to 5 inches; gravelly sandy loam

Bt2—5 to 12 inches; coarse sandy loam

BCt—12 to 14 inches; extremely gravelly loamy coarse sand

Crt—14 to 59 inches; bedrock

## **Description of Jumborox, Warm Soil**

### **Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Aspect (representative):* East

*Aspect range:* North to southeast (clockwise)

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granite

*Vegetation:* Mojave yucca, blackbrush, desert senna, redstem stork's bill, and creosote bush

### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.9 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 5.0 inches)

### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Loamy Very Deep Fan Remnants (R030XB183CA)

*Hydric soil status:* No

*Hydrologic soil group:* B

**Typical Profile**

A1—0 to 1 inch; loamy sand  
A2—1 to 3 inches; loamy sand  
Bt—3 to 17 inches; gravelly sandy loam  
Btk—17 to 28 inches; gravelly loamy sand  
Bk1—28 to 53 inches; gravelly loamy sand  
Bk2—53 to 71 inches; gravelly sand

**Description of Rock Outcrop**

**Setting**

*Landform:* Pediments  
*Aspect:* All aspects  
*Slope range:* 2 to 100 percent  
*Definition:* Areas of exposed granite without a soil mantle

**Minor Components**

**Pinecity, cool soils**

*Percent of map unit:* 5 percent  
*Slope:* 8 to 30 percent  
*Landform:* Sloping side slopes of pediments  
*Ecological site:* Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)

**Pinecity, moist soils**

*Percent of map unit:* 5 percent  
*Slope:* 2 to 8 percent  
*Landform:* Fan aprons on pediments  
*Ecological site:* Cool Shallow Fans Over Pediment (R030XB188CA)

**Littlefargo soils**

*Percent of map unit:* 3 percent  
*Slope:* 2 to 8 percent  
*Landform:* Fan remnants on pediments  
*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

**Morongo, occasionally flooded soils**

*Percent of map unit:* 3 percent  
*Slope:* 2 to 4 percent  
*Landform:* Drainageways  
*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Morongo, rarely flooded soils**

*Percent of map unit:* 3 percent  
*Slope:* 2 to 4 percent  
*Landform:* Inset fans  
*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Ambrosia, cool soils**

*Percent of map unit:* 1 percent  
*Slope:* 0 to 4 percent  
*Landform:* Fan remnants  
*Ecological site:* Loamy Very Deep Fan Remnants (R030XB183CA)

## **4615—Desertqueen-Jumborox-Rock outcrop association, 2 to 15 percent slopes**

### **Map Unit Setting**

*Landscape:* Hills

*Major land resource area:* 30—Mojave Desert

*Elevation:* 4,375 to 5,115 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

### **Map Unit Composition**

Desertqueen, cool and similar soils: 45 percent

Jumborox and similar soils: 25 percent

Rock outcrop: 15 percent

Dissimilar minor components: 15 percent

### **Description of Desertqueen, Cool Soil**

#### **Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplargids

#### **Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope and nose slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* Northwest to west (clockwise)

*Slope range:* 15 to 30 percent

*Parent material:* Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss

*Vegetation:* Blackbrush, red brome, and rubber rabbitbrush

#### **Properties and Qualities**

*Depth to restrictive feature:* 8 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 1.0 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.3 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

*Hydric soil status:* No

*Hydrologic soil group:* D



### **Typical Profile**

A—0 to 3 inches; sandy loam

Bt—3 to 13 inches; sandy loam

Crt—13 to 59 inches; bedrock

### **Description of Jumborox Soil**

#### **Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

#### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear and convex

*Across-slope shape:* Linear and convex

*Aspect (representative):* Southeast

*Aspect range:* Northwest to west (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from gneiss and/or alluvium derived from granitoid

*Vegetation:* Muller oak, blackbrush, Eastern Mojave buckwheat, red brome, and pincushion flower

#### **Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches

*Shrink-swell potential:* Low (about 0.9 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 5.4 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Cool Deep Sandy Fans (R030XB168CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### **Typical Profile**

A1—0 to 1 inch; sand

A2—1 to 4 inches; loamy sand

Bt1—4 to 14 inches; sandy loam

Bt2—14 to 22 inches; sandy loam

Bt3—22 to 37 inches; loamy sand

BCt—37 to 71 inches; loamy sand

### **Description of Rock Outcrop**

#### **Setting**

*Landform:* Hills

*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granite and gneiss without a soil mantle

### Minor Components

#### **Desertqueen, steep soils**

*Percent of map unit:* 5 percent

*Slope:* 30 to 50 percent

*Landform:* Hills

*Ecological site:* Shallow Cool Hills (R030XB189CA)

#### **Morongo, occasionally flooded soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 4 percent

*Landform:* Drainageways

*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

#### **Pinecity soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 15 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Dissected Pediment, Cool (R030XB166CA)

## **4620—Stranger-Rock outcrop-Grubstake complex, 8 to 50 percent slopes**

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,820 to 3,885 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

### Map Unit Composition

Stranger and similar soils: 40 percent

Rock outcrop: 35 percent

Grubstake, moist and similar soils: 20 percent

Dissimilar minor components: 5 percent

### Description of Stranger Soil

#### **Classification**

Mixed, thermic Lithic Torripsamments

#### **Setting**

*Landform:* Pediments

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Nose slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Southwest

*Aspect range:* Southeast to west (clockwise)

*Slope range:* 8 to 50 percent

*Parent material:* Residuum weathered from granitoid

*Vegetation:* Hall's shrubby-spurge, burrobush, Parish's goldeneye, Bigelow's nolina, and Engelmann's hedgehog cactus

**Properties and Qualities**

*Depth to restrictive feature:* 3 to 10 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.2 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Warm Sloping Pediments (R030XB225CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; loamy sand

C—1 to 3 inches; sand

R—3 to 13 inches; bedrock

**Description of Rock Outcrop**

**Setting**

*Landform:* Pediments

*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

**Description of Grubstake, Moist Soil**

**Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplocambids

**Setting**

*Landform:* Pediments

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* Southwest

*Aspect range:* Southeast to west (clockwise)

*Slope range:* 8 to 30 percent

*Parent material:* Residuum weathered from granitoid

*Vegetation:* Burrobush, Mojave yucca, creosote bush, jojoba, and Nevada jointfir

**Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to paralithic bedrock; 18 to 37 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.9 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.6 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

A—0 to 1 inch; loamy fine sand

Bw—1 to 15 inches; sandy loam

Cr—15 to 18 inches; bedrock

R—18 to 28 inches; bedrock

### Minor Components

#### Cajon, occasionally flooded soils

*Percent of map unit:* 5 percent

*Slope:* 2 to 8 percent

*Landform:* Narrow drainageways

*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

## 4625—Grinder-Pinkcan complex, 4 to 30 percent slopes

### Map Unit Setting

*Landscape:* Fan piedmonts

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,900 to 4,035 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 270 to 320 days

### Map Unit Composition

Grinder and similar soils: 50 percent

Grinder, cool and similar soils: 20 percent

Pinkcan, cool and similar soils: 15 percent

Dissimilar minor components: 15 percent

### Description of Grinder Soil

#### Classification

Loamy, mixed, superactive, thermic Lithic Haplargids

#### Setting

*Landform:* Pediments

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Nose slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Northwest

## Soil Survey of Joshua Tree National Park, California

*Aspect range:* Southwest to north (clockwise)

*Slope range:* 4 to 30 percent

*Parent material:* Residuum weathered from granitoid

*Vegetation:* Burrobush, blackbrush, Mojave yucca, and Hall's shrubby-spurge

### Properties and Qualities

*Depth to restrictive feature:* 8 to 14 inches to lithic bedrock

*Shrink-swell potential:* Low (about 1.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.8 inch)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Loamy Fan Remnants And Pediments (R030XB221CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### Typical Profile

A—0 to 0.5 inch; gravelly fine sandy loam

Bt1—0.5 inch to 3 inches; gravelly fine sandy loam

Bt2—3 to 8 inches; gravelly sandy loam

R—8 to 18 inches; bedrock

## Description of Grinder, Cool Soil

### Classification

Loamy, mixed, superactive, thermic Lithic Haplargids

### Setting

*Landform:* Pediments

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Nose slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* Northwest

*Aspect range:* Southwest to north (clockwise)

*Slope range:* 4 to 30 percent

*Parent material:* Residuum weathered from granitoid

*Vegetation:* Hall's shrubby-spurge, Parish's goldeneye, burrobush, and Eastern Mojave buckwheat

### Properties and Qualities

*Depth to restrictive feature:* 8 to 14 inches to lithic bedrock

*Shrink-swell potential:* Low (about 1.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately high

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.8 inch)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Warm Sloping Pediments (R030XB225CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

A—0 to 1 inch; gravelly loam

Bt1—1 to 3 inches; gravelly fine sandy loam

Bt2—3 to 8 inches; gravelly sandy loam

R—8 to 18 inches; bedrock

### **Description of Pinkcan, Cool Soil**

#### **Classification**

Fine-loamy, mixed, superactive, thermic Duric Petroargids

#### **Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* Northwest

*Aspect range:* Southwest to north (clockwise)

*Slope range:* 4 to 15 percent

*Parent material:* Alluvium derived from granitoid

*Vegetation:* Burrobush, blackbrush, Mojave yucca, and Hall's shrubby-spurge

#### **Properties and Qualities**

*Depth to restrictive feature:* 39 to 59 inches to moderately cemented duripan

*Shrink-swell potential:* Low (about 2.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* 1

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* Moderately low

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 5.6 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Loamy Fan Remnants And Pediments (R030XB221CA)

*Hydric soil status:* No

*Hydrologic soil group:* B

#### **Typical Profile**

A—0 to 0.5 inch; sandy loam

Bt1—0.5 inch to 11 inches; sandy loam

Bt2—11 to 19 inches; sandy clay loam  
Btk—19 to 25 inches; loam  
BC—25 to 28 inches; sandy loam  
C—28 to 33 inches; gravelly sandy loam  
2Bt—33 to 47 inches; gravelly sandy loam  
2Bkqm—47 to 60 inches; cemented loamy sand

**Minor Components**

**Rock outcrop**

*Percent of map unit:* 8 percent  
*Slope:* 2 to 30 percent

**Arizo, rarely flooded soils**

*Percent of map unit:* 5 percent  
*Slope:* 2 to 8 percent  
*Landform:* Inset fans  
*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**Cajon, frequently flooded soils**

*Percent of map unit:* 2 percent  
*Slope:* 2 to 8 percent  
*Landform:* Channels  
*Ecological site:* Mid Size Thermic To Hyperthermic Ephemeral Stream  
(R030XY186CA)

**4630—Thunderclap-Smithcanyon complex, 4 to 15 percent slopes**

**Map Unit Setting**

*Landscape:* Hills  
*Major land resource area:* 30—Mojave Desert  
*Elevation:* 4,490 to 5,295 feet  
*Mean annual precipitation:* 7 to 10 inches  
*Mean annual air temperature:* 55 to 63 degrees F  
*Frost-free period:* 210 to 270 days

**Map Unit Composition**

Thunderclap and similar soils: 50 percent  
Smithcanyon and similar soils: 30 percent  
Dissimilar minor components: 20 percent

**Description of Thunderclap Soil**

**Classification**

Mixed, thermic Xeric Torripsamments

**Setting**

*Landform:* Fan aprons on pediments  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* North  
*Aspect range:* West to northeast (clockwise)



## Soil Survey of Joshua Tree National Park, California

*Slope range:* 4 to 8 percent

*Parent material:* Alluvium derived from granitoid and/or alluvium derived from gneiss over residuum weathered from granitoid and/or residuum weathered from gneiss

*Vegetation:* Smooth desertdandelion, annual forbs, Great Basin langloisia, small wirelettuce, and Mojave yucca

### Properties and Qualities

*Depth to restrictive feature:* 59 to 79 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.2 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Low (about 3.8 inches)

### Interpretive Groups

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Xeric Very Deep Sandy Fan Aprons On Pediments (R030XE200CA)

*Hydric soil status:* No

*Hydrologic soil group:* A

### Typical Profile

A1—0 to 2 inches; sand

A2—2 to 11 inches; sand

C1—11 to 39 inches; sand

C2—39 to 63 inches; sand

Cr—63 to 79 inches; bedrock

## Description of Smithcanyon Soil

### Classification

Mixed, thermic, shallow Xeric Torripsamments

### Setting

*Landform:* Low hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northeast

*Aspect range:* West to northeast (clockwise)

*Slope range:* 8 to 15 percent

*Parent material:* Colluvium derived from gneiss and/or colluvium derived from granitoid over residuum weathered from gneiss and/or residuum weathered from granitoid

*Vegetation:* Singleleaf pinyon, blackbrush, and Muller oak

### Properties and Qualities

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.7 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Sandy Xeric-Intergrade Slopes (R030XE196CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A1—0 to 1 inch; loamy sand

A2—1 to 8 inches; loamy sand

C—8 to 13 inches; gravelly sand

Cr—13 to 59 inches; bedrock

**Minor Components**

**Smithcanyon, moderately steep soils**

*Percent of map unit:* 8 percent

*Slope:* 15 to 30 percent

*Landform:* Low hills

*Ecological site:* Xeric Very Deep Sandy Fan Aprons On Pediments (R030XE200CA)

**Rock outcrop**

*Percent of map unit:* 5 percent

*Slope:* 4 to 50 percent

**Stubbespring soils**

*Percent of map unit:* 5 percent

*Slope:* 8 to 15 percent

*Landform:* Low hills

*Ecological site:* Xeric Very Deep Sandy Fan Aprons On Pediments (R030XE200CA)

**Thunderclap, rarely flooded soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 8 percent

*Landform:* Channels

*Ecological site:* Very Rarely To Rarely Flooded Thermic Ephemeral Stream  
(R030XY202CA)

**4804—Rock outcrop-Ironped-Pinecity association, 30 to 60 percent slopes**

**Map Unit Setting**

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,950 to 4,625 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 68 degrees F

*Frost-free period:* 210 to 320 days

### Map Unit Composition

Rock outcrop: 45 percent  
Ironped and similar soils: 25 percent  
Pinecity and similar soils: 20 percent  
Dissimilar minor components: 10 percent

### Description of Rock Outcrop

#### Setting

*Landform:* Hills  
*Aspect:* All aspects  
*Slope range:* 2 to 100 percent  
*Definition:* Areas of exposed granite without a soil mantle

### Description of Ironped Soil

#### Classification

Mixed, thermic, shallow Typic Torripsamments

#### Setting

*Landform:* South-facing side slopes and/or slopes on hills, at elevations below 4,000 feet  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Aspect (representative):* South  
*Aspect range:* East to southwest (clockwise)  
*Slope range:* 30 to 60 percent  
*Parent material:* Residuum weathered from granite  
*Vegetation:* Parish's goldeneye, creosote bush, bristly fiddleneck, and Mojave sage

#### Properties and Qualities

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock  
*Shrink-swell potential:* Low (about 0.4 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* None  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Very low (about 0.1 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated):* 8  
*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)  
*Hydric soil status:* No  
*Hydrologic soil group:* D

#### Typical Profile

A—0 to 2 inches; gravelly loamy sand  
Cr—2 to 59 inches; bedrock

### Description of Pinecity Soil

#### Classification

Mixed, thermic, shallow Typic Torripsamments

#### Setting

*Landform*: North-facing side slopes and/or slopes on hills, at elevations above 4,000 feet

*Landform position (two-dimensional)*: Backslope

*Landform position (three-dimensional)*: Side slope

*Down-slope shape*: Linear

*Across-slope shape*: Linear

*Aspect (representative)*: North

*Aspect range*: West to northeast (clockwise)

*Slope range*: 30 to 50 percent

*Parent material*: Colluvium derived from granite over residuum weathered from granite

*Vegetation*: Red brome, narrowleaf goldenbush, blackbrush, Mexican bladdersage, desert globemallow, and California juniper

#### Properties and Qualities

*Depth to restrictive feature*: 2 to 14 inches to paralithic bedrock

*Shrink-swell potential*: Low (about 0.5 LEP)

*Salinity maximum based on representative value*: Nonsaline

*Sodicity maximum*: Not sodic

*Calcium carbonate equivalent percent*: No carbonates

#### Hydrologic Properties

*Slowest capacity to transmit water ( $K_{sat}$ )*: High

*Natural drainage class*: Somewhat excessively drained

*Flooding frequency*: None

*Ponding frequency*: None

*Depth to seasonal water table*: Not present within a depth of 72 inches

*Available water capacity (entire profile)*: Very low (about 0.4 inch)

#### Interpretive Groups

*Land capability subclass (nonirrigated)*: 8

*Ecological site*: Shallow Cool Hills (R030XB189CA)

*Hydric soil status*: No

*Hydrologic soil group*: D

#### Typical Profile

A—0 to 1 inch; gravelly loamy sand

Bw—1 to 6 inches; gravelly loamy sand

Cr—6 to 59 inches; bedrock

### Minor Components

#### Littlefargo soils

*Percent of map unit*: 5 percent

*Slope*: 30 to 50 percent

*Landform*: Hills

*Ecological site*: Shallow Cool Hills (R030XB189CA)

#### Arizo, occasionally flooded soils

*Percent of map unit*: 3 percent

*Slope*: 8 to 15 percent

*Landform*: Narrow drainageways

*Ecological site*: Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)

**Pinecity, cool soils**

*Percent of map unit:* 2 percent

*Slope:* 30 to 60 percent

*Landform:* Hills

*Ecological site:* Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)

**4805—Rock outcrop-Ironped association, 8 to 15 percent slopes**

**Map Unit Setting**

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,870 to 3,800 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Rock outcrop: 50 percent

Ironped, cool and similar soils: 30 percent

Dissimilar minor components: 20 percent

**Description of Rock Outcrop**

**Setting**

*Landform:* Pediments

*Aspect:* All aspects

*Slope range:* 2 to 5 percent

*Definition:* Areas of exposed granite without a soil mantle

**Description of Ironped, Cool Soil**

**Classification**

Mixed, thermic, shallow Typic Torripsamments

**Setting**

*Landform:* Fan aprons on pediments

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 8 to 15 percent

*Parent material:* Alluvium derived from granite over residuum weathered from granite

*Vegetation:* Blackbrush, Acton's brittlebush, redstem stork's bill, trefoil, and Nevada jointfir

**Properties and Qualities**

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.4 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.1 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Dissected Pediment (R030XB171CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 2 inches; gravelly loamy sand

Cr—2 to 59 inches; bedrock

**Minor Components**

**Lostpalms, cool soils**

*Percent of map unit:* 12 percent

*Slope:* 15 to 50 percent

*Landform:* Steep pediments

*Ecological site:* Dissected Pediment (R030XB171CA)

**Morongo, warm soils**

*Percent of map unit:* 5 percent

*Slope:* 4 to 8 percent

*Landform:* Fan aprons

*Ecological site:* Dissected Pediment (R030XB171CA)

**Morongo, frequently flooded soils**

*Percent of map unit:* 3 percent

*Slope:* 4 to 8 percent

*Landform:* Channels

*Ecological site:* Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)

**4806—Rock outcrop**

**Map Unit Setting**

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,755 to 4,730 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 270 days

**Map Unit Composition**

Rock outcrop: 90 percent

Dissimilar minor components: 10 percent

**Description of Rock Outcrop**

**Setting**

*Landform:* Hills and pediments

*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granite without a soil mantle

### Minor Components

#### **Pinecity, cool soils**

*Percent of map unit:* 5 percent

*Slope:* 15 to 50 percent

*Landform:* Hills

*Ecological site:* Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)

#### **Pinecity, gravelly loamy sand soils**

*Percent of map unit:* 5 percent

*Slope:* 15 to 20 percent

*Landform:* Areas around rock on hills as pockets of soil and areas around rock on mountains as pockets of soil

*Ecological site:* Shallow Cool Hills (R030XB189CA)

## **4811—Rock outcrop-Pioneertown association, 30 to 60 percent slopes, dry**

### Map Unit Setting

*Major land resource area:* 30—Mojave Desert

*Elevation:* 4,000 to 5,800 feet

*Mean annual precipitation:* 5 to 8 inches

*Mean annual air temperature:* 55 to 63 degrees F

*Frost-free period:* 210 to 270 days

### Map Unit Composition

Rock outcrop: 85 percent

Pioneertown and similar soils: 10 percent

Dissimilar minor components: 5 percent

### Description of Rock Outcrop

#### **Setting**

*Landform:* Hills and pediments

*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granite without a soil mantle

### Description of Pioneertown Soil

#### **Classification**

Mixed, thermic Lithic Torripsamments

#### **Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* Southeast

*Aspect range:* North to south (clockwise)

*Slope range:* 30 to 60 percent

*Parent material:* Colluvium derived from granite over residuum weathered from granite

*Vegetation:* Muller oak, blackbrush, red brome, desert needlegrass, combseed, and Sandberg bluegrass



**Properties and Qualities**

*Depth to restrictive feature:* 2 to 14 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.5 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 4 inches; gravelly sand

C—4 to 10 inches; gravelly loamy sand

R—10 to 20 inches; bedrock

**Minor Components**

**Dalvord, cool soils**

*Percent of map unit:* 5 percent

*Slope:* 15 to 50 percent

*Landform:* South-facing, low-elevation footslopes and hills

*Ecological site:* Shallow Cool Hills (R030XB189CA)

**4825—Rock outcrop-Grubstake-Cajon-Stranger  
association, 2 to 15 percent slopes**

**Map Unit Setting**

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,310 to 3,145 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Rock outcrop: 30 percent

Grubstake and similar soils: 20 percent

Cajon, rarely flooded and similar soils: 20 percent

Stranger, warm and similar soils: 15 percent

Dissimilar minor components: 15 percent

**Description of Rock Outcrop**

**Setting**

*Landform:* Pediments

*Aspect:* All aspects

*Slope range:* 2 to 30 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

### **Description of Grubstake Soil**

#### **Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplocambids

#### **Setting**

*Landform:* Pediments

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Aspect (representative):* North

*Aspect range:* West to northeast (clockwise)

*Slope range:* 2 to 15 percent

*Parent material:* Residuum weathered from granitoid

*Vegetation:* Creosote bush, white ratany, sweetbush, and burrobrush

#### **Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to paralithic bedrock; 18 to 37 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.9 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Well drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.6 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7e

*Ecological site:* Warm Shallow Pediments (R030XB228CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

A—0 to 1 inch; loamy fine sand

Bw—1 to 15 inches; sandy loam

Cr—15 to 18 inches; bedrock

R—18 to 28 inches; bedrock

### **Description of Cajon, Rarely Flooded Soil**

#### **Classification**

Mixed, thermic Typic Torripsamments

#### **Setting**

*Landform:* Fan aprons

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Aspect (representative):* North  
*Aspect range:* West to northeast (clockwise)  
*Slope range:* 4 to 8 percent  
*Parent material:* Alluvium derived from granitoid  
*Vegetation:* Creosote bush, Mojave yucca, and white ratany

**Properties and Qualities**

*Depth to restrictive feature:* None within a depth of 60 inches  
*Shrink-swell potential:* Low (about 0.3 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* 1

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High  
*Natural drainage class:* Somewhat excessively drained  
*Flooding frequency:* Rare (see table 24)  
*Ponding frequency:* None  
*Depth to seasonal water table:* Not present within a depth of 72 inches  
*Available water capacity (entire profile):* Low (about 3.5 inches)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s  
*Ecological site:* LIMY 5-7 P.Z. (R030XB005NV)  
*Hydric soil status:* No  
*Hydrologic soil group:* A

**Typical Profile**

A—0 to 1 inch; sand  
Bw—1 to 19 inches; loamy sand  
C1—19 to 38 inches; gravelly loamy coarse sand  
C2—38 to 59 inches; gravelly coarse sand

**Description of Stranger, Warm Soil**

**Classification**

Mixed, thermic Lithic Torripsamments

**Setting**

*Landform:* Pediments  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Nose slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Aspect (representative):* North  
*Aspect range:* West to northeast (clockwise)  
*Slope range:* 2 to 15 percent  
*Parent material:* Residuum weathered from granitoid  
*Vegetation:* Desertsenna, creosote bush, burrobrush, Mojave yucca, and white ratany

**Properties and Qualities**

*Depth to restrictive feature:* 3 to 10 inches to lithic bedrock  
*Shrink-swell potential:* Low (about 0.1 LEP)  
*Salinity maximum based on representative value:* Nonsaline  
*Sodicity maximum:* Not sodic  
*Calcium carbonate equivalent percent:* No carbonates

**Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.5 inch)

**Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Warm Shallow Pediments (R030XB228CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

**Typical Profile**

A—0 to 1 inch; sand

C—1 to 9 inches; sand

R—9 to 19 inches; bedrock

**Minor Components**

**Ironped soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 8 percent

*Landform:* Fan aprons on pediments

*Ecological site:* Warm Shallow Pediments (R030XB228CA)

**Lostpalms soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 8 percent

*Landform:* Pediments

*Ecological site:* Warm Shallow Pediments (R030XB228CA)

**Grinder, warm soils**

*Percent of map unit:* 5 percent

*Slope:* 2 to 8 percent

*Landform:* Pediments

*Ecological site:* Warm Shallow Pediments (R030XB228CA)

**4830—Rock outcrop-Pinecity complex, 8 to 30 percent slopes**

**Map Unit Setting**

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,785 to 5,015 feet

*Mean annual precipitation:* 3 to 7 inches

*Mean annual air temperature:* 55 to 73 degrees F

*Frost-free period:* 210 to 340 days

**Map Unit Composition**

Rock outcrop: 80 percent

Pinecity, cool and similar soils: 10 percent

Dissimilar minor components: 10 percent

**Description of Rock Outcrop**

**Setting**

*Landform:* Pediments

*Aspect:* All aspects

*Slope range:* 4 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

### **Description of Pinecity, Cool Soil**

#### **Classification**

Mixed, thermic, shallow Typic Torripsamments

#### **Setting**

*Landform:* Areas within rock outcrop on pediments

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Interfluvium

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Southeast

*Aspect range:* Northeast to southwest (clockwise)

*Slope range:* 8 to 30 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Muller oak, blackbrush, red brome, desert needlegrass, combseed, and Sandberg bluegrass

#### **Properties and Qualities**

*Depth to restrictive feature:* 2 to 14 inches to paralithic bedrock

*Shrink-swell potential:* Low (about 0.5 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.4 inch)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 7s

*Ecological site:* Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

A—0 to 1 inch; gravelly loamy sand

Bw—1 to 6 inches; gravelly loamy sand

Cr—6 to 59 inches; bedrock

### **Minor Components**

#### **Blackeagle soils**

*Percent of map unit:* 5 percent

*Slope:* 30 to 80 percent

*Landform:* South-facing, low-elevation (below 1,130 meters) slopes on mountains

*Ecological site:* Hyperthermic Steep South Slopes (R030XD003CA)

#### **Stranger soils**

*Percent of map unit:* 3 percent

*Slope:* 4 to 30 percent

*Landform:* Between rock outcrops on pediments

*Ecological site:* Warm Sloping Pediments (R030XB225CA)

**Grubstake, moist soils**

*Percent of map unit:* 2 percent

*Slope:* 4 to 30 percent

*Landform:* Pediments

*Ecological site:* Limy Hill 5-7" p.z. (R030XB140CA)

**4900—Rock outcrop-Aguilareal-Lostpalms complex, 8 to 50 percent slopes**

**Map Unit Setting**

*Major land resource area:* 30—Mojave Desert

*Elevation:* 2,095 to 3,640 feet

*Mean annual precipitation:* 4 to 7 inches

*Mean annual air temperature:* 63 to 68 degrees F

*Frost-free period:* 270 to 320 days

**Map Unit Composition**

Rock outcrop: 65 percent

Aguilareal and similar soils: 15 percent

Lostpalms and similar soils: 15 percent

Dissimilar minor components: 5 percent

**Description of Rock Outcrop**

**Setting**

*Landform:* Hills

*Aspect:* All aspects

*Slope range:* 2 to 100 percent

*Definition:* Areas of exposed granitoid rocks without a soil mantle

**Description of Aguilareal Soil**

**Classification**

Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids

**Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 8 to 50 percent

*Parent material:* Colluvium derived from granitoid over residuum weathered from granitoid

*Vegetation:* Parish's goldeneye, creosote bush, catclaw acacia, Eastern Mojave buckwheat, Nevada jointfir, and redstem stork's bill

**Properties and Qualities**

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.8 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 1.1 inches)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 8

*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

#### **Typical Profile**

C—0 to 3 inches; stones

A—3 to 4 inches; very gravelly loamy sand

Bk1—4 to 14 inches; very gravelly sandy loam

Bk2—14 to 19 inches; very gravelly sandy loam

### **Description of Lostpalms Soil**

#### **Classification**

Sandy-skeletal, mixed, thermic Lithic Torriorthents

#### **Setting**

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Aspect (representative):* Northeast

*Aspect range:* Northwest to east (clockwise)

*Slope range:* 8 to 50 percent

*Parent material:* Residuum weathered from granitoid

*Vegetation:* Parish's goldeneye, creosote bush, catclaw acacia, Eastern Mojave buckwheat, Nevada jointfir, and redstem stork's bill

#### **Properties and Qualities**

*Depth to restrictive feature:* 2 to 14 inches to lithic bedrock

*Shrink-swell potential:* Low (about 0.3 LEP)

*Salinity maximum based on representative value:* Nonsaline

*Sodicity maximum:* Not sodic

*Calcium carbonate equivalent percent:* No carbonates

#### **Hydrologic Properties**

*Slowest capacity to transmit water ( $K_{sat}$ ):* High

*Natural drainage class:* Somewhat excessively drained

*Flooding frequency:* None

*Ponding frequency:* None

*Depth to seasonal water table:* Not present within a depth of 72 inches

*Available water capacity (entire profile):* Very low (about 0.5 inch)

#### **Interpretive Groups**

*Land capability subclass (nonirrigated):* 8



## Soil Survey of Joshua Tree National Park, California

*Ecological site:* Warm Gravelly Shallow Hills (R030XB172CA)

*Hydric soil status:* No

*Hydrologic soil group:* D

### **Typical Profile**

A—0 to 1 inch; gravelly loamy fine sand

C—1 to 7 inches; very cobbly loamy fine sand

R—7 to 17 inches; bedrock

### **Minor Components**

#### **Lostpalms, warm soils**

*Percent of map unit:* 3 percent

*Slope:* 30 to 60 percent

*Landform:* Hills

*Ecological site:* Thermic Steep South Slopes (R030XB164CA)

#### **Dalvord soils**

*Percent of map unit:* 2 percent

*Slope:* 15 to 50 percent

*Landform:* Hills

*Ecological site:* Limy Hill 3-5" P.Z. (R030XB139CA)



# Ecological Sites

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Compiled by Alice Miller and Marchel Munnecke, Pyramid Botanical Consultants.

## Characterization and Management of Rangelands

Rangelands are used for many purposes; therefore, it is important to characterize and quantify these areas based upon their ability to produce various kinds, proportions, and amounts of plants. These abilities and their resultant plant communities are largely dependent on the soil, climate, topography, aspect, and slope of the landscape, as well as on other abiotic features. To better understand these soil-plant interactions and the effects of selected management practices, the Natural Resources Conservation Service classifies rangelands into ecological sites.

Landscapes of native vegetation are divided into ecological sites for the purposes of inventory, evaluation, and management. An ecological site, as defined for rangeland, is a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. The reference community for a rangeland ecological site has less than 25 percent tree species overstory canopy cover. Rangeland vegetation provides many habitat components, assists in controlling soil erosion, is suitable for grazing or browsing by wildlife and domestic animals, and offers scenic and recreational opportunities. Rangeland is environmentally and economically important.

An ecological site is the product of all the environmental factors responsible for its development, including parent material, landscape, climate, soils, living organisms, hydrology, fire, and time in place. Ecological site descriptions contain information on each of these environmental factors. Included are brief descriptions of:

a) physiographic and climatic features; b) major identifiable plant community types that may occupy the site, including the reference plant community; c) total annual production; d) ecological dynamics of the plant communities; e) soils and their main properties; and f) site interpretations and general management considerations for wildlife, hydrology, recreation, fire, aesthetics, and restoration/revegetation.

The reference plant community for a site is the plant community that has evolved under natural ecological processes and disturbances and is considered to be at its highest natural potential under the current climate. This plant community has developed on the site as a result of all site-forming factors and is best adapted to the unique combination of environmental factors associated with the site. Natural disturbances, such as fire, drought, herbivory, and flooding, were inherent in the development and maintenance of these reference plant communities. Plant communities that are or have been subjected to anthropogenic disturbances or physical site deterioration or have been protected from their natural disturbance regimes do not typify the reference state and may exist in a stable or steady state that is different from the reference plant community.

The reference plant community of an ecological site is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. In all plant communities, variability is apparent in the productivity and occurrence of individual species. Boundaries of ecological site communities can be recognized by

characteristic patterns of species composition, association, and community structure. Generally one species or group of species dominates the site, and the stability of these dominants within the natural dynamics of the site allows them to be used as a distinguishing factor to differentiate one site from another. The initial description of the reference state should be considered as an approximation subject to modification as additional knowledge is gained or discovered.

Plant communities change along environmental gradients. When changes in soils, aspect, topography, or moisture conditions are abrupt, the plant community boundaries will be reasonably distinct. Boundaries are less distinct where the plant communities change gradually over wide environmental gradients of relatively uniform soils and topography. Thus, the need for site differentiation may not be readily apparent until the cumulative impact of soil, topography, hydrology, or climate is examined over a broad area. Frequently, such differences are reflected first in production and second in the kinds and proportions of plant species making up the core of the plant community.

The following criteria are used to differentiate one ecological site from another:

1. Significant differences in the species or species groups that are in the reference plant community.
2. Significant differences in the relative proportion of species or species groups in the reference plant community.
3. Significant differences in the total annual production of the reference plant community.
4. Soil factors that determine plant production and composition, the hydrology of the site, and the functioning of the ecological processes of the hydrology cycle, mineral cycles, and energy flow.

For detailed description of USDA-NRCS Ecological Site Description inventory methods, see the "National Range and Pasture Handbook" (available online at <http://www.glti.nrcs.usda.gov/technical/publications/nrph.html>).

## General Description of Vegetation in the Park

Joshua Tree National Park spans a dramatic ecological transition zone between the higher, cooler, and drier Mojave Desert (MLRA 30) in the northwest region of the park and the lower and hotter Colorado Desert (MLRA 31) in the southeast. Further, the northwestern corner of the park represents a transition between the western edge of the Mojave Desert region and the neighboring cooler and wetter Southern California Mountains (MLRA 20). Elevations within the park range from 390 feet on low-lying alluvial fans to 5,813 feet at the top of Quail Mountain. As elevation increases, mean annual precipitation increases and mean annual air temperature decreases. Mean annual precipitation ranges from 2 inches to 10 inches, and mean annual air temperature ranges from 81 to 55 degrees F.

Ecological sites within the park are dominated by shrublands. At lower, warmer elevations, creosote bush (*Larrea tridentata*) shrublands in which sparse creosote bush is codominant with burrobrush (*Ambrosia dumosa*) and/or brittlebush (*Encelia farinosa*) are characteristic. These communities dominated by sparse creosote bush become more diverse and productive as elevation increases, eventually developing into Joshua tree woodlands. At the cooler, mid-elevations, blackbrush (*Coleogyne ramosissima*) shrublands occur; at the highest elevations where temperatures are coolest and amounts of precipitation highest, singleleaf pinyon (*Pinus monophylla*) and California juniper (*Juniperus californica*) shrublands occur. The survey area has ephemeral streams throughout. At the cooler, higher elevations, areas of ephemeral streams are dominated by catclaw acacia (*Acacia greggii*), desert willow (*Chilopsis linearis*), and burrobrush (*Hymenoclea salsola*). At the lower, warmer elevations, areas of ephemeral streams are dominated by smoketree (*Psoralea argemone*), desert lavender (*Hyptis emoryi*), blue paloverde (*Parkinsonia florida*), and desert ironwood (*Olearya tesota*).

In addition to elevation, landform and soil characteristics affect species composition and annual production. Common landforms in the survey area include alluvial fans, fan aprons, fan remnants, pediments, and mountains. Common landforms for ephemeral streams are drainageways, channels, and inset fans. Very deep, sandy soils are typical of alluvial fans, fan aprons, and drainageways, while older soils with argillic, calcic, or duripan development are more common on fan remnants. Mountain soils are generally shallow with varying levels of rock fragments in the soil or on the surface. In the desert where annual precipitation is low and evaporation rates are high, the available water capacity is higher in deep, coarser soils than in fine textured soils. Water can quickly and deeply infiltrate into coarse sandy soils. Loamy textured soils have a higher available water capacity but their slower infiltration rates cause water to be held closer to the surface, where it is easily lost to evaporation.

Most of Joshua Tree National Park is within the Mojave Desert (MLRA 30). Only the southern boundary of the park is considered part of the Colorado Desert (MLRA 31). The Colorado Desert is hotter than most of the Mojave Desert, with only a rare incidence of freezing, and it receives a greater proportion of summer precipitation (July to September) from monsoons coming from the southeast. Plant species considered indicators of the Colorado Desert include blue paloverde (*Parkinsonia florida*) and desert ironwood (*Olneya tesota*). These species are frost intolerant and rely on summer rains for germination of seeds and survival of seedlings. Joshua tree (*Yucca brevifolia*) and Mojave yucca (*Yucca schidigera*) are considered indicator species of the Mojave Desert but only occur at the mid-elevations of the desert where soil temperatures are cool thermic.

To better describe the wide environmental variability of the Mojave Desert (MLRA 30), Land Resource Units (LRUs) were designated to group this MLRA into similar land units. LRUs within the Mojave Desert are primarily defined by temperature and precipitation. These LRUs are defined below, under the general ecological site descriptions. There are 72 ecological sites correlated in this soil survey. The descriptions are dynamic documents that are constantly updated as new research and data is gained; thus, the online version, even after approval, will be the most recent version of the descriptions. The full site descriptions of all 72 ecological sites will be available online at:

<https://esis.sc.egov.usda.gov/Welcomes/pgReportLocation.aspx?type=ESD> after final approval. The following plant nomenclature is from the USDA Plants Database, which is online at <http://plants.usda.gov/index.html>.

## Definition of Table Headers and Discussion of Data

The tables in this section display the correlation between map unit soil components and ecological sites. The data represented in these tables refers to canopy cover and annual production by dry weight and was collected at the same location as the representative soil pit. This data does not represent the “climax” community but rather the many community phases that may be present at any given point in time. Due to complex geomorphology, elevation gradients, and microclimates, there is not always a definitive line where one ecological site ends and another begins but rather a broad transition zone as one ecological site gradually converts to another.

Differences in soil properties, precipitation, and climate that affect plant community composition, production, and distribution are accounted for in the correlation of ecological sites to individual soil map unit components.

### Table 3—Climate, Landscape, Landform, Parent Material, and Ecological Site

This table summarizes the climatic features by map unit symbol and soil name (component), component percent, and the correlated ecological site name and

number. Climatic features include, slope, elevation, MAP (mean annual precipitation), landscape, landform, and parent material.

**Table 4—Ecological Site-Soil Correlation**

This table lists the map unit symbol, soil name (component), and component percent with the ecological site name, ecological site type (forestland or rangeland), and ecological site ID (ecological site number).

**Table 5—Ecological Sites and Characteristic Plant Communities**

This table lists the map unit symbol, soil name (component), and component percent; the ecological site name and number; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation using common names; and the average species composition by annual production (percent of total annual air-dry weight) for rangeland ecological sites.

*Total production* is the amount of vegetation that can be expected to grow annually on well managed rangeland and support the potential natural plant community. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation provide substantially better growing conditions than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

*Dry weight* is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percentage of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods. These production amounts can be used to calculate carrying capacities and stocking rates for the management of domestic or wild animals or to determine fuel-loading in preparation of prescribed burning plans or fire modeling.

*Characteristic vegetation* includes the grasses, forbs, shrubs, and trees that are associated with the soil component. The associated plants are listed by common name in table 8.

**Table 6—Canopy Cover**

This table is sorted by map unit symbol, soil name (component), and component percent. It displays the correlated ecological site name and number with the percent canopy cover of the characteristic vegetation. Canopy cover, by definition, is the amount of cover determined by crown perimeter-vertical projection by species. As cover can overlap in layers by species, total cover can be more than 100 percent. If a tree species is listed twice, the smaller number represents understory canopy that is less than 13 feet in height. This table lists canopy cover for rangeland ecological sites.

**Table 7—Correlated Ecological Sites**

This table lists the correlated ecological sites by ecological site ID with ecological site name.

**Table 8—Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Common Name**

This table alphabetically lists the species by local common name and shows the plant symbol and scientific name. The plant nomenclature is from the USDA Plants Database, which is available online at <http://plants.usda.gov/index.html>.

**Table 9—Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Plant Symbol**

This table alphabetically lists the species by plant symbols and shows local common name and scientific name. The plant symbol is from the USDA Plants Database, which is available online at <http://plants.usda.gov/index.html>.

## General Ecological Sites

Prepared by Marchel Munnecke, Pyramid Botanical Consultant.

The general ecological sites map is based on the dominant ecological site within a map unit, by percentage. Ecological sites that are not dominant in any map unit are not included in the groups below.

### 1. MLRA 31, Creosote bush and/or brittlebush, all slope Complex

Creosote bush (*Larrea tridentata*) and/or brittlebush (*Encelia farinosa*) dominate. Other species include Schott's dalea (*Psoralea schottii*), teddybear cholla (*Cylindropuntia bigelovii*), and ocotillo (*Fouquieria splendens*). This group occurs on fan remnants, fan aprons, or steep side slopes of fan remnants. Composition and production vary depending upon surface rock fragments, slope, vicinity to mountain base, and occurrence of surface flooding.

- R031XY002CA Desert Pavement 2-4" p.z.; /*Larrea tridentata*-*Encelia farinosa*/*Plantago ovata*-*Chorizanthe rigida*
- R031XY003CA Steep South Slope 2-4" p.z; /*Encelia farinosa*-*Larrea tridentata*/*Eriogonum deflexum*-*Plantago ovata*
- R031XY009CA Gravelly Fan Remnants And Fan Aprons; /*Larrea tridentata*-*Psoralea schottii*/*Chorizanthe brevicornu*
- R031XY030CA Extremely Stony Fan Remnants; /*Cylindropuntia bigelovii*-*Encelia farinosa*
- R031XY200CA Rarely Flooded Fans; /*Larrea tridentata*-*Encelia farinosa*
- R031XY201CA Cobbly Fan Remnants; /*Larrea tridentata*-*Encelia farinosa*

### 2. MLRA 31, Ephemeral stream Complex

This group is composed of ephemeral streams associated with drainageways that experience occasional to frequent, flash-flood events. Common species are blue paloverde (*Parkinsonia florida*), desert ironwood (*Olneya tesota*), smoketree (*Psoralea spinosus*), burrobrush (*Hymenoclea salsola*), and desert lavender (*Hyptis emoryi*). A diversity of plant communities can occur, depending upon the frequency and intensity of flooding within the drainageway.

- R031XY010CA Valley Wash; *Parkinsonia florida*-*Chilopsis linearis*/*Acacia greggii*-*Hymenoclea salsola*/*Chamaesyce albomarginata*-*Oenothera deltoides*
- R031XY026CA Large, High Intensity, Frequently Flooded Ephemeral Stream; *Olneya tesota*-*Parkinsonia florida*/*Hymenoclea salsola*-*Hyptis emoryi*
- R031XY034CA Gravelly, Braided, Ephemeral Stream; *Parkinsonia florida*-*Olneya tesota*/*Hymenoclea salsola*-*Hyptis emoryi*
- R030XY038CA Flooded Gravelly Fans; /*Larrea tridentata*-*Senna armata*/*Pectocarya recurvata*-*Malacothrix glabrata* (Note: This ecological site does not have a defined drainageway and is not a true ephemeral stream. It is subject to sheet flood events.)

### 3. Hyperthermic, Creosote bush and/or burrobush, low slope Complex

This group is dominated by creosote bush (*Larrea tridentata*) shrublands. Landforms are alluvial fans, fan remnants, fan aprons, and pediments. Slopes are



typically between 0 to 15 percent. Vegetation ranges from very sparse creosote bush to communities with low cover and production of creosote bush and burrobush (*Ambrosia dumosa*). Brittlebush (*Encelia farinosa*) is abundant in ecological site R030XY039CA. Ecological site R030XD023CA occurs on dissected pediments and has more diversity due to surface run-on and undulating topography.

- R030XY002CA Desert Pavement; /*Larrea tridentata* (hyperthermic soil correlation)
- R030XD006CA Dry Deep Sandy Fan Aprons; /*Larrea tridentata*/*Plantago ovata*
- R030XD015CA Hyperthermic Fans; /*Larrea tridentata*-*Ambrosia dumosa*
- R030XD023CA Hyperthermic Dissected Shallow Pediment; /*Psoralea arborescens*-*Senna armata*
- R030XD039CA Coarse Gravelly Fans; /*Larrea tridentata*-*Encelia farinosa*
- R030XD042CA Hyperthermic Shallow to Moderately Deep Fan Remnants; /*Larrea tridentata*-*Ambrosia dumosa*/*Cryptantha*

#### **4. Hyperthermic, Creosote bush and/or big galleta, aeolian influence Complex**

This group is influenced by eolian sand deposits. It has very deep, fine sandy soils. Creosote bush (*Larrea tridentata*) and/or big galleta (*Pleuraphis rigida*) are dominant. Other common species include dyebush (*Psoralea emoryi*), burrobush (*Ambrosia dumosa*), and other shrubs and annuals.

- R030XD025CA Hyperthermic Sandsheets; /*Larrea tridentata*-*Psoralea emoryi*/*Plantago ovata*-*Chaenactis fremontii*
- R030XD008CA Hyperthermic Sandhill; /*Larrea tridentata*-*Ambrosia dumosa*/*Pleuraphis rigida*
- R030XD014CA Hyperthermic Sandy Plains; /*Larrea tridentata*/*Pleuraphis rigida*

#### **5. Hyperthermic, Creosote bush, burrobush, and/or brittlebush, slope Complex**

This group is dominated by low-statured, widely spaced creosote bush (*Larrea tridentata*) with burrobush (*Ambrosia dumosa*) or brittlebush (*Encelia farinosa*) codominant. This group is on mountain slopes, hillslopes, or side slopes of fan remnants.

- R030XD001CA Hyperthermic Dry Hills; /*Larrea tridentata*-*Ambrosia dumosa*/*Pectocarya recurvata*-*Malacothrix glabrata*
- R030XD003CA Hyperthermic Steep South Slopes; /*Encelia farinosa*-*Larrea tridentata*
- R030XD004CA Low-Production Hyperthermic Hills; /*Larrea tridentata*/*Chaenactis fremontii*

#### **6. Thermic, Creosote bush and/or burrobush, low slope Complex**

This group is dominated by creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa*) with a diversity of other species. Hall's shrubby-spurge (*Tetradlea hallii*) is a dominant shrub with creosote bush and burrobush in the Cottonwood Basin. This group occurs on gently sloping alluvial fans, fan aprons, fan remnants, and pediments. Production and cover vary depending upon surface run-on, surface rock fragments, desert pavement surface development, and soil depth.

- R030XY002CA Desert Pavement; /*Larrea tridentata* (thermic soil correlation)
- R030XB005NV LIMY 5-7 P.Z.; /*Ambrosia dumosa*-*Larrea tridentata*/*Pleuraphis rigida*
- R030XB019NV LIMY 3-5 P.Z.; /*Larrea tridentata*
- R030XB137CA Granitic Loam; / *Larrea tridentata*-*Ambrosia dumosa*/*Pleuraphis rigida*
- R030XB156CA Limy 5-7" p.z. (Low Production); /*Larrea tridentata*-*Ambrosia dumosa*

- R030XB174CA Sandy Fan Aprons; *Yucca brevifolia*/*Larrea tridentata*/*Pleuraphis rigida*
- R030XB192CA Very Rarely Flooded, Warm Thermic Fan Piedmonts; *Senna armata*-*Larrea tridentata*/*Pleuraphis rigida*
- R030XB220CA Very Shallow Duripan Fan Remnants; *Ambrosia dumosa*-*Ziziphus obtusifolia*
- R030XB218CA Moderately Deep To Very Deep Loamy Fan Remnants; *Ambrosia dumosa*-*Tetracoccus hallii*
- R030XB225CA Warm Sloping Pediments; *Tetracoccus hallii*-*Ambrosia dumosa*
- R030XB228CA Warm Shallow Pediments; *Larrea tridentata*-*Ambrosia dumosa*/*Malacothrix glabrata*

#### 7. Thermic, Creosote bush and/or burrobush, slope Complex

This group has a diversity of shrubs but is dominated by creosote bush (*Larrea tridentata*), burrobush (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), and/or Parish's goldeneye (*Viguiera parishii*). This group occurs on hillslopes and mountain slopes. The dominant species varies depending upon cover of surface rock fragments, percent rock outcrop, and temperature variations.

- R030XB139CA Limy Hill 3-5" P.Z; *Larrea tridentata*
- R030XB140CA Limy Hill 5-7" p.z; *Ambrosia dumosa*-*Larrea tridentata*/*Achnatherum speciosum*
- R030XB164CA Thermic Steep South Slopes; *Encelia farinosa*-*Larrea tridentata*
- R030XB172CA Warm Gravelly Shallow Hills; *Viguiera parishii*-*Larrea tridentata*
- R030XB193CA Very Shallow To Moderately Deep Gravelly Slopes; *Ambrosia dumosa*-*Viguiera parishii*/*Pleuraphis rigida*

#### 8. MLRA 30, Ephemeral stream Complex

This group is composed of ephemeral streams associated with drainageways that experience occasional to frequent, flash-flood events. Common species are desert willow (*Chilopsis linearis*), catclaw acacia (*Acacia greggii*), smoketree (*Psoralea arguta*), and burrobush (*Hymenoclea salsola*). A diversity of plant communities can occur, depending upon frequency and intensity of flooding within a drainageway.

- R030XY001CA Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream; *Larrea tridentata*-*Psoralea arguta*/*Chamaesyce albomarginata*
- R030XY010CA Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream; *Chilopsis linearis*-*Psoralea arguta*/*Hymenoclea salsola*-*Acacia greggii*/*Malacothrix glabrata*-*Pectocarya recurvata*
- R030XY167CA Large, Sandy, Thermic, Ephemeral Stream; *Chilopsis linearis*/*Acacia greggii*-*Hymenoclea salsola*

#### 9. Thermic, Blackbrush with creosote bush and/or burrobush, low slope Complex

This group is a mixed shrubland with blackbrush (*Coleogyne ramosissima*) dominant and creosote bush (*Larrea tridentata*) and/or burrobush codominant. It occurs on gently sloping fan aprons, fan remnants, and pediments.

- R030XB171CA Dissected Pediment; *Coleogyne ramosissima*-*Ambrosia dumosa*
- R030XB183CA Loamy Very Deep Fan Remnants; *Coleogyne ramosissima*-*Larrea tridentata*
- R030XB188CA Cool Shallow Fans Over Pediment; *Coleogyne ramosissima*-*Larrea tridentata*

- R030XB221CA Loamy Fan Remnants And Pediments; /*Coleogyne ramosissima*-*Ambrosia dumosa*

**10. Cool-thermic, Blackbrush, California juniper, and/or Joshua tree, all slope Complex**

This group is dominated by blackbrush (*Coleogyne ramosissima*) with California juniper (*Juniperus californica*) and/or Joshua tree. It occurs on mountains, hills, pediments, alluvial fans, and fan remnants.

- R030XB166CA Dissected Pediment, Cool; *Juniperus californica*/*Coleogyne ramosissima*
- R030XB168CA Cool Deep Sandy Fans; *Yucca brevifolia*/*Coleogyne ramosissima*-*Juniperus californica*
- R030XB173CA Coarse Loamy Very Deep Fan Remnants; *Yucca brevifolia*/*Coleogyne ramosissima*/*Pleuraphis rigida*
- R030XB189CA Shallow Cool Hills; /*Coleogyne ramosissima*-*Juniperus californica*

**11. Aridic bordering on xeric intergrade, California juniper-singleleaf pinyon, all slope Complex**

This group is dominated by Muller oak (*Quercus cornelius-mulleri*), singleleaf pinyon (*Pinus monophylla*), and (*Juniperus californica*) with a diversity of other shrubs and sub-shrubs. It occurs on mountain slopes and hillslopes, at the upper elevations.

- R030XE191CA Dry Sandy Mountain Slopes; *Quercus cornelius-mulleri*-*Pinus monophylla*
- R030XE196CA Sandy Xeric-Intergrade Slopes; *Pinus monophylla*-*Juniperus californica*/*Quercus cornelius-mulleri*-*Arctostaphylos glauca*
- R030XE200CA Xeric Very Deep Sandy Fan Aprons On Pediments; *Pinus monophylla*/*Coleogyne ramosissima*-*Quercus cornelius-mulleri*

**12. Rock Outcrop - Singleleaf pinyon pine, Muller's oak, blackbrush Complex**

Rock outcrop covers 90 percent or more cover of the area. Singleleaf pinyon (*Pinus monophylla*), Muller oak (*Quercus cornelius-mulleri*) and California juniper (*Juniperus californica*) are dominant around rock outcrops, and blackbrush (*Coleogyne ramosissima*) is dominant on shallow soils among rock outcrops.

- R030XB170CA Bouldery Very Shallow To Shallow Gravelly Slopes; *Pinus monophylla*/*Coleogyne ramosissima*-*Quercus cornelius-mulleri*

**Brief Summary of Ecological Sites**

Below is a short description of each ecological site occurring within the Joshua Tree National Park soil survey, organized by MLRA and land resource unit (LRU). The descriptions begin with the site ID and site name followed by the biotic name.

**Mojave Desert Major land Resource Area (MLRA 30)**

**LRU XY, Ubiquitous in MLRA (Environmental or Chemical Features Dominate)**

LRU XY occurs throughout the Mojave Desert MLRA. This LRU designation is used for ecological sites that are ubiquitous throughout the MLRA. These sites are driven by environmental or chemical features that override the climatic designations of the other LRUs or are atypical compared to the surrounding landscape. Common overriding LRU XY characteristics in MLRA 30 include ephemeral streams subject to flash-flood



Figure 1.—R030XY002CA Desert Pavement on Russioks soils in map unit 1540.

events, other water features, sand dunes, and soils with strong chemical influence (such as from sodium, calcium, etc.).

**R030XY002CA Desert Pavement; /*Larrea tridentata*.** This ecological site occurs on fan remnants, ballenas, and fan aprons (fig. 1). It is defined by the presence of desert pavement surfaces and a fine aeolian vesicular layer. Elevations range from 520 to 2,950 feet. Slopes are typically between 0 and 4 percent. A range of soil development may occur under the desert pavement surfaces. Soils are generally hyperthermic (but may be thermic). The surface is covered by interlocking rock fragments (desert pavement). The pavement surface limits water infiltration, which limits production and diversity. Desert pavement rocks are often covered with desert patina, a thin varnish of clay, manganese, and iron oxides. Vegetation is sparse. Production is dominated by annual forbs that develop on patches of thin aeolian deposits above the gravel layer. Creosote bush (*Larrea tridentata*) covers a low amount of the site and is confined to breaks in the pavement surface. Annual production ranges from 10 to 91 pounds per acre with a representative value (RV) of 58 pounds per acre.

**R030XY154CA Dune 3-5" P.Z.; *Prosopis glandulosa* var. *torreyana*-*Atriplex polycarpa*/*Suaeda moquinii*-*Croton californicus*.** This ecological site occurs on stabilized sand dunes and sand sheets associated with a permanent groundwater source (fig. 2). This site occurs at relatively low positions within the bolson but where the water table is more than 10 feet below the surface. Soils are thermic and hyperthermic. Elevations range from 520 to 2,250 feet. Slopes range from 0 to 30 percent. Soils are very deep, have sand and fine sand textures, are somewhat excessively drained, and formed from sandy aeolian material. These soils are typically calcareous and moderately alkaline. Total cover increases as dunes are progressively stabilized. The reference vegetation community consists of a dense stand of shrubs dominated by western honey mesquite (*Prosopis glandulosa* var. *torreyana*) and fourwing saltbush (*Atriplex canescens*). The plant community includes a mix of





**Figure 2.—R030XY154CA Dune 3-5" P.Z. on Cambidic Haplodurids in map unit 1541.**



**Figure 3.—R030XY001CA Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream on Pintobasin soils in map unit 1525.**



Figure 4.—R030XY010CA Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream on Dragonwash soils in map unit 4440.

phreatophytic, salt-tolerant plants commonly associated with sandy soils and upland species, such as creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa*). The production reference value (RV) is 525 pounds per acre but may range from 190 to 660 pounds per acre, depending on dune stabilization and annual precipitation.

The remaining XY ecological sites are ephemeral stream complexes with several associated plant communities that have evolved with flash-flood events. Soils are generally very deep and composed of sand and gravel. Production values are not listed if there are several community types within the ecological site.

**R030XY001CA Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream; *Larrea tridentata*-*Psoralea schottii*/*Chamaesyce albomarginata*.**

This ecological site is associated with first- and second-order drainageways, where water flow loses velocity or becomes divergent across inset fans and fan aprons (fig. 3). It is associated with hyperthermic soils. Elevations range from 1,020 to 3,280 feet. Slopes range from 0 to 8 percent. There is a small active drainageway, but the majority of this site is prone to low-intensity sheet floods of lower frequency. Creosote bush (*Larrea tridentata*), Schott's dalea (*Psoralea schottii*), and burrobush (*Ambrosia dumosa*) are dominant on this site.

**R030XY010CA Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream; *Chilopsis linearis*-*Psoralea spinosus*/*Hymenoclea salsola*-*Acacia greggii*/*Malacothrix glabrata*-*Pectocarya recurvata*.** This ecological site occurs on third-order or larger ephemeral drainages (fig. 4). The landforms are drainageways, channels, and inset fans. Elevations range from 1,030 to 3,790 feet. Slopes range from 0 to 8 percent. This site is associated with hyperthermic and warm





**Figure 5.—R030XY021CA Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream on Carrizon soils in map unit 1540.**



**Figure 6.—R030XY038CA Flooded Gravelly Fans on Carrizon, channeled soils in map unit 1511.**



thermic soils. This ephemeral stream has large, occasional to frequent flash-flood events. Although this site has large drainage basins, it is located in medial and distal positions on alluvial fans where the volume and velocity of water flow have slowed and where sediment transport is predominantly sand and gravel. The main channels provide a deep water source and have a frequent flooding regime that supports desert willow (*Chilopsis linearis*), catclaw acacia (*Acacia greggii*), and smoketree (*Psoralea arguta*). A range of flooding intensities along and across the drainageway supports several community components.

**R030XY021CA Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream; /*Encelia farinosa*-*Larrea tridentata*/*Cryptantha-Chamaesyce abramsiana*.** This ecological site is on inset fans, in drainageways, and on stream terraces on fan remnants that typically have desert pavement surfaces (fig. 5). Soils are hyperthermic. Elevations range from 570 to 2,800 feet. Slopes typically range from 2 to 8 percent. These ephemeral streams capture runoff from the adjacent fan remnants, leading to occasional flash-flood events of low intensity. Creosote bush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), burrobush (*Ambrosia dumosa*), and white ratany (*Krameria grayi*) are important species.

**R030XY038CA Flooded Gravelly Fans; /*Larrea tridentata*-*Senna armata*/*Pectocarya recurvata*-*Malacothrix glabrata*.** This ecological site occurs on channeled, rarely flooded alluvial fans and fan aprons that are within the transitional zone between thermic and hyperthermic soil temperatures (fig. 6). Elevations range from 1,510 to 3,280 feet. Slopes range from 2 to 8 percent. This site has rare sheet flooding. Flooding, gravelly soils, a channeled topography, and a transitional climate support a diverse shrub mixture, dominated by Schott's dalea (*Psoralea schottii*), creosote bush (*Larrea tridentata*), and desertsenna (*Senna armata*).

**R030XY128CA Broad, Gravelly, Hyperthermic Ephemeral Stream; /*Hymenoclea salsola*-*Psoralea schottii*/*Camissonia-Phacelia tanacetifolia*.** This ecological site occurs at the base of steep mountains and receives water flow from third-order or larger channels (fig. 7). Landforms are channels, drainageways, and inset fans. This site is subject to large flash-flood events, which become less concentrated as flow disperses across the fan. The soils are primarily hyperthermic. Elevations range from 390 to 3,770 feet. Slopes range from 2 to 15 percent. The site is dominated by burrobush (*Hymenoclea salsola*), Schott's dalea (*Psoralea schottii*), desert lavender (*Hyptis emoryi*), creosote bush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), and sweetbush (*Bebbia juncea*).

**R030XY159CA Gravelly Outwash; /*Senna armata*-*Larrea tridentata*.** This ecological site occurs on gently sloping alluvial fans, fan aprons, and inset fans that are subject to very rare sheet flooding from adjacent slopes (fig. 8). The soils have a thermic temperature regime. Elevations range from 1,920 to 4,100 feet. Slopes range from 1 to 8 percent. The site is dominated by creosote bush (*Larrea tridentata*) and desertsenna (*Senna armata*). Burrobush (*Ambrosia dumosa*) is also an important species. Sheet flooding provides additional moisture and establishment opportunities for desertsenna. The deep, coarse soils have a high available water capacity, which supports desertsenna and productive creosote bush. The production reference value (RV) is 350 pounds per acre but may range from 219 to 521 pounds per acre, depending on annual precipitation.

**R030XY167CA Large, Sandy, Thermic, Ephemeral Stream; *Chilopsis linearis*/*Acacia greggii*-*Hymenoclea salsola*.** This ecological site occurs on relatively large, third-order or larger drainageways and is subject to frequent flash-flood events (fig. 9). Catchment size may range from 5,000 to more than 56,000 acres. Elevations range from 2,100 to 5,120 feet. Slopes typically range from 2 to 4 percent. The soils have a thermic soil temperature regime. This site commonly begins at the slope break between steep mountains and the aggrading alluvial fans or where two second-order



Figure 7.—R030XY128CA Broad, Gravelly, Hyperthermic Ephemeral Stream on Carrizo soils (minor component) in map unit 2111.



Figure 8.—R030XY159CA Gravelly Outwash on Hypoint soils in map unit 3526.





Figure 9.—R030XY167CA Large, Sandy, Thermic, Ephemeral Stream on Morongo soils in map unit 3680.

streams merge. These drainages provide a relatively consistent deep-water source, which supports desert willow communities. Flood intensity, scour, and sediment transport vary across the drainageway and along the channel segments, creating a complex of plant communities. Desert willow (*Chilopsis linearis*) and catclaw acacia (*Acacia greggii*) are prominent along these streams. Burrobrush (*Hymenoclea salsola*) is in less flooded areas. Other common shrubs include desert almond (*Prunus fasciculata*), desertsenna (*Senna armata*), Mojave indigobush (*Psoralea arborescens*), and peach thorn (*Lycium cooperi*).

**R030XY186CA Mid Size Thermic To Hyperthermic Ephemeral Stream; /Acacia greggii-Hymenoclea salsola.** This ecological site is associated with first- and second-order ephemeral streams subject to occasional and frequent flash-flood events (fig. 10). These ephemeral streams have a catchment size ranging from 1,000 to 5,000 acres. This site occurs in channels, in drainageways, and on inset fans on fan piedmonts. It extends from the hyperthermic to the cool thermic soil temperature zone. Elevations range from 1,150 to 5,000 feet. Slopes range from 2 to 8 percent. This site is a complex of plant communities including catclaw acacia (*Acacia greggii*) on active channel margins, a catclaw acacia-burrobrush (*Hymenoclea salsola*) community on depositional bars with lower relief, and a creosote bush (*Larrea tridentata*)-burrobrush mixed shrub community on semistable depositional bars with higher relief.

**R030XY187CA Rarely Flooded Warm Thermic Ephemeral System; /Larrea tridentata-Hymenoclea salsola.** This ecological site occurs in small, rarely flooded drainageways (fig. 11). These first-order ephemeral streams develop from runoff from the adjacent alluvial fans. Some locations may also receive runoff from small mountain drainageways. The soils have a thermic temperature regime. Elevations range from 2,140 to 4,170 feet. Slopes range from 2 to 4 percent. The concentrated runoff provides a higher water availability in the drainageway than the surrounding fans and



**Figure 10.—R030XY186CA Mid Size Thermic To Hyperthermic Ephemeral Stream on Arizo soils (minor component) in map unit 4285.**



**Figure 11.—R030XY187CA Rarely Flooded Warm Thermic Ephemeral System on Morongo soils in map unit 3683.**





Figure 12.—R030XY188CA Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream on Olympus soils (minor component) in map unit 3509.

supports a productive and diverse shrub community composed of a mix of long- and short-lived species. Creosote bush (*Larrea tridentata*) and burrobush (*Hymenoclea salsola*) dominate.

**R030XY188CA Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream; /*Larrea tridentata*-*Tetradococcus hallii*/Amsinckia tessellata-Salvia columbariae.** This ecological site occurs on inset fans and in drainageways associated with first- and second-order ephemeral streams (fig. 12). These ephemeral streams have rare to occasional flash-flood events, which disperse water across the broad, unconfined drainageways and inset fans. The soils have a thermic temperature regime. Elevations range from 2,390 to 3,440 feet. Slopes range from 2 to 8 percent. The soils are generally slightly alkaline or moderately alkaline. Hall's shrubby-spurge (*Tetradococcus hallii*) and creosote bush (*Larrea tridentata*) dominate but there can be a complex of plant communities, depending upon flood disturbance. This site is considered part of MLRA 30 but may receive a higher percentage of summer precipitation than is usual in this MLRA. This higher amount of precipitation may benefit Hall's shrubby-spurge.

**R030XY202CA Very Rarely To Rarely Flooded Thermic Ephemeral Stream; /*Ephedra californica*-*Hymenoclea salsola*.** This ecological site occurs on channels and stream terraces of first-order ephemeral streams on upper alluvial fans (fig. 13). A rarely flooded, narrow, active channel occurs with a very rarely flooded, associated stream terrace. This site has rare to occasional, low-intensity flash-flood events. The soil moisture regime is aridic or aridic bordering on xeric, and the soil temperature regime is thermic. Elevations range from 3,280 to 5,250 feet. Slopes range from 2 to 8 percent. This site is dominated by California jointfir (*Ephedra californica*), burrobush (*Hymenoclea salsola*), and Mojave indigobush (*Psoralea arborescens*). Joshua



Figure 13.—R030XY202CA Very Rarely to Rarely Flooded Thermic Ephemeral Stream on Morongo soils in map unit 3685.

tree (*Yucca brevifolia*) may grow in stable areas. Water inputs on this site are not enough to support xeroriparian plants, such as desert willow (*Chilopsis linearis*) and catclaw acacia (*Acacia greggii*).

#### **LRU XB, Thermic Soil Temperature Regime**

LRU XB occurs across the eastern half of California, much of the mid-elevations of Nevada, the southernmost portions of western Utah, and the mid-elevations of northwestern Arizona. Elevations range from 1,800 to 5,200 feet. Precipitation ranges from 4 to 9 inches per year but is generally between 5 to 6 inches. This LRU is characterized primarily by the summer precipitation it receives, ranging from 18 to 35 inches and averaging 25 inches. Summer precipitation falls between July and September in the form of rain; winter precipitation falls starting in December and ends between February and March, also mostly in the form of rain. This LRU also can receive between 0 and 3 inches of snow per year, with an average of 1 inch. The soil temperature regime is thermic, and the soil moisture regime is typic-aridic. Vegetation includes creosote bush (*Larrea tridentata*), burrobush (*Ambrosia dumosa*), Nevada jointfir (*Ephedra nevadensis*), ratany (*Krameria*), Mojave yucca (*Yucca schidigera*), Joshua tree (*Yucca brevifolia*), cactus, big galleta grass (*Pleuraphis rigida*), and several other warm-season grasses. At the upper elevations of the LRU, plant production and diversity are greater and blackbrush (*Coleogyne ramosissima*) is a common dominant shrub.

#### **LRU XB with Cool Thermic Soil Temperature Regime**

**R030XB166CA Dissected Pediment, Cool; *Juniperus californica*/Coleogyne ramosissima.** This ecological site occurs on granitic pediments and in more stable areas of fan remnants on top of granitic pediments (fig. 14). Elevations range from



approximately 3,300 to 5,200 feet. Slopes range from 4 to 30 percent. The soils are typically very shallow or shallow loamy sands that have high rates of runoff. Blackbrush (*Coleogyne ramosissima*) dominates, and California juniper (*Juniperus californica*) is an important secondary species. The production reference value (RV) is 249 pounds per acre but may range from 92 to 438 pounds per acre, depending on annual precipitation and annual species production.

**R030XB168CA Cool Deep Sandy Fans; *Yucca brevifolia*/Coleogyne ramosissima-Juniperus californica.** This ecological site occurs on fan aprons and fan remnants that are located adjacent to mountains (fig. 15). The soils are typically very deep and coarse textured. Elevations range from 3,280 to 5,200 feet. Slopes range from 2 to 15 percent. Cooler temperatures exclude creosote bush (*Larrea tridentata*) from this site and allow blackbrush (*Coleogyne ramosissima*) and California juniper (*Juniperus californica*) to dominate. This site includes some very large, old-growth Joshua tree (*Yucca brevifolia* var. *brevifolia*) forests. At the higher elevations, Joshua tree is limited by freezing temperatures. At the lower elevations, blackbrush is limited by a low available soil water capacity. The production representative value (RV) is 595 pounds per acre but may range from 380 to 920 pounds per acre.

**R030XB170CA Bouldery Very Shallow To Shallow Gravelly Slopes; *Pinus monophylla*/Coleogyne ramosissima-Quercus cornelius-mulleri.** This ecological site occurs on rocky hillslopes and mountain slopes (fig. 16). Elevations typically range from 3,300 to 5,800 feet. Slopes range from 30 to 60 percent. There is a high percentage of rock outcrops throughout the site. Very shallow or shallow sandy soils are on slopes among outcrops. Singleleaf pine (*Pinus monophylla*), California juniper (*Juniperus californica*), and Muller oak (*Quercus cornelius-mulleri*) are dominant in areas around rock outcrops, and blackbrush (*Coleogyne ramosissima*) is dominant



Figure 14.—R030XB166CA Dissected Pediment, Cool on Pinecity soils in map unit 4606.





Figure 15.—R030XB168CA Cool Deep Sandy Fans on Jumborox soils in map unit 3679.



Figure 16.—R030XB170CA Bouldery Very Shallow To Shallow Gravelly Slopes on Pinecity soils in map unit 3285.



Figure 17.—R030XB171CA Dissected Pediment on Ironped soils in map unit 4805.

on shallow soils among outcrops. The roots of singleleaf pinyon, California juniper, and Muller oak can access the relatively high content of water in cracks in the weathering granitic bedrock of rock outcrops and between large surface fragments. The production reference value (RV) is 680 pounds per acre but may range from 315 to 930 pounds per acre.

**R030XB171CA Dissected Pediment; /*Coleogyne ramosissima*-*Ambrosia dumosa*.** This ecological site occurs on dissected, sloping pediments punctuated by monzogranite outcrops (fig. 17). Elevations range from 2,900 to 3,800 feet. Slopes typically range from 8 to 15 percent. The soils are sandy and very shallow or shallow over granitic bedrock. This site is weakly dominated by blackbrush (*Coleogyne ramosissima*) with a high diversity of secondary shrubs, including burrobush (*Ambrosia dumosa*), Parish's goldeneye (*Viguiera parishii*), desertsenna (*Senna armata*), creosote bush (*Larrea tridentata*), and catclaw acacia (*Acacia greggii*). Additional runoff from adjacent outcrops and water flow in interfluvies provide moisture for creosote bush, catclaw acacia, and desertsenna, which tend to occupy low points on the pediment. Although blackbrush is well adapted to shallow soils, this ecological site is at the lower elevations of its range. Blackbrush does not thrive in these warmer climates, and individual plants are stunted and less competitive than in cooler climates. The production reference value (RV) is 242 pounds per acre but may range from 76 to 400 pounds per acre, depending on annual precipitation and annual species production.

**R030XB173CA Coarse Loamy Very Deep Fan Remnants; *Yucca brevifolia*/ *Coleogyne ramosissima*/ *Pleuraphis rigida*.** This ecological site occurs on fan remnants (fig. 18). Elevations range from 3,510 to 4,590 feet. Slopes range from 2 to 8 percent. The soils are very deep and have sand and loamy sand surface layers and loamy sand or sandy loam subsurface layers. Blackbrush (*Coleogyne*





Figure 18.—R030XB173CA Coarse Loamy Very Deep Fan Remnants on Jumborox soils (minor component) in map unit 3676.

*ramosissima*) and Joshua tree (*Yucca brevifolia* var. *brevifolia*) dominate the site, and big galleta (*Pleuraphis rigida*) is an important herbaceous species. This site spans the elevation zone at which Joshua tree and blackbrush can be codominant. At the higher elevations, Joshua tree is limited by freezing temperatures. At the lower elevations, blackbrush is limited by a low available soil water capacity. Sandy surface horizons enhance habitat for Joshua tree and big galleta, which have shallow roots systems capable of rapidly responding to intermittently available moisture near the soil surface. Loamy soil textures increase the amount of moisture held at shallow depths during the winter wet season, favoring the dominance of blackbrush. The production reference value (RV) is 610 pounds per acre but may range from 250 to 900 pounds per acre because of the highly variable production of annual forbs and grasses.

**R030XB183CA Loamy Very Deep Fan Remnants; /*Coleogyne ramosissima*-*Larrea tridentata*.** This ecological site occurs on fan aprons, fan remnants, and fan aprons over fan remnants (fig. 19). Elevations range from 2,950 to 5,130 feet. Slopes range from 2 to 8 percent. The soils are very deep and typically have a well developed argillic horizon. This site is dominated by blackbrush (*Coleogyne ramosissima*) and creosote bush (*Larrea tridentata*). It occurs in the climatic envelope where creosote bush and blackbrush coexist. The production reference value (RV) is 304 pounds per acre but may range from 140 to 492 pounds per acre, depending on annual precipitation and annual species production.

**R030XB188CA Cool Shallow Fans Over Pediment; /*Coleogyne ramosissima*-*Larrea tridentata*.** This ecological site occurs on fan aprons over a pediment with very shallow or shallow soils (fig. 20). Elevations range from 3,200 to 5,130 feet. Slopes range from 2 to 15 percent. This site is dominated by blackbrush (*Coleogyne ramosissima*) and creosote bush (*Larrea tridentata*). Joshua tree (*Yucca brevifolia*)

covers a low amount of the site. This pediment is relatively buried with alluvium and is flat and undissected. This provides a surface in which creosote bush can establish and be competitive with blackbrush. The production reference value (RV) is 460 pounds per acre but may range from 335 to 750 pounds per acre, depending on annual precipitation and annual species production.

**R030XB189CA Shallow Cool Hills; /*Coleogyne ramosissima*-*Juniperus californica*.** This ecological site occurs on hillslopes and mountain slopes with shallow soils (fig. 21). Elevations range from 3,300 to 5,700 feet. Slopes typically range from 30 to 60 percent. This site is dominated by blackbrush (*Coleogyne ramosissima*) and California juniper (*Juniperus californica*). Blackbrush is shallow rooted and very efficient at extracting water from shallow soils. California juniper can thrive in both shallow and deep soils. The production reference value (RV) is 393 pounds per acre but may range from 170 to 690 pounds per acre, depending on annual precipitation and annual species production.

**R030XB213CA Moderately Deep Gravelly Mountain Slopes; *Juniperus californica*/*Eriogonum fasciculatum*/*Achnatherum speciosum*.** This ecological site occurs on mountain slopes (fig. 22). Elevations range from approximately 3,400 to 4,800 feet. This site has soils with a thermic temperature regime but includes the transition from cool thermic soils. The soils are moderately deep over weathered bedrock and sandy-skeletal. Vegetative cover is relatively sparse. It is dominated by eastern Mojave buckwheat (*Eriogonum fasciculatum*) with California juniper (*Juniperus californica*), desert needlegrass (*Achnatherum speciosum*), and a diverse assemblage of secondary shrubs. Steep slopes and sandy-skeletal soils increase soil erosion, which favors short-lived species, such as eastern Mojave buckwheat and desert



Figure 19.—R030XB183CA Loamy Very Deep Fan Remnants on Jumborox soils in map unit 4610.





Figure 20.—R030XB188CA Cool Shallow Fans Over Pediment on Pinecity soils in map unit 4605.

needlegrass (*Achnatherum speciosum*). The production reference value (RV) is 345 pounds per acre but may range from 111 to 495 pounds per acre.

#### **LRU XB with Warm Thermic Soil Temperature Regime**

**R030XB005NV LIMY 5-7 P.Z.; /*Ambrosia dumosa*-*Larrea tridentata*/*Pleuraphis rigida*.** This ecological site occurs on fan aprons and fan remnants (fig. 23). This site is extensive in the Mojave Desert, in both California and Nevada. In the park, it is associated with very deep, sandy or loamy soils that have a thermic temperature regime. Elevations range from 1,980 to 3,940 feet. Slopes generally range from 4 to 8 percent. This site is dominated by a relatively productive community of burrobush (*Ambrosia dumosa*) and creosote bush (*Larrea tridentata*). Secondary shrubs include Mojave yucca (*Yucca schidigera*) and chollas (*Cylindropuntia* spp.), and forbs occur seasonally. The production reference value (RV) is 300 pounds per acre but may range from 200 to 500 pounds per acre.

**R030XB019NV LIMY 3-5 P.Z.; /*Larrea tridentata*.** This ecological site occurs on alluvial fans and fan remnants (fig. 24). Within the park, this ecological site is associated with very deep soils that have argillic horizons and a thermic temperature regime. Elevations range from approximately 2,000 to 3,800 feet. Slopes range from 2 to 8 percent. This site commonly has incipient desert pavement surfaces among more developed desert pavement surfaces. There is a sparse cover of low-statured creosote bush (*Larrea tridentata*). Burrobush (*Ambrosia dumosa*) and brittlebush (*Encelia farinosa*) grow in adjacent drainageways and become established along the margins of this site. The production reference value (RV) is 125 pounds per acre but may range from 75 to 200 pounds per acre.





Figure 21.—R030XB189CA Shallow Cool Hills on Desertqueen soils in map unit 3285.



Figure 22.—R030XB213CA Moderately Deep Gravelly Mountain Slopes on Bigbernie soils in map unit 3336.





Figure 23.—R030XB005NV LIMY 5-7 P.Z. on Helendale soils in map unit 4041.



Figure 24.—R030XB019NV LIMY 3-5 P.Z. on Yuccabutte, dry soils (minor component) in map unit 4275.





Figure 25.—R030XB137CA Granitic Loam on Gravesumit soils in map unit 4064.

**R030XB137CA Granitic Loam; /*Larrea tridentata*-*Ambrosia dumosa*/*Pleuraphis rigida*.** This ecological site occurs on sand sheets, fan aprons, fan aprons over fan remnants, and fan remnants (fig. 25). Within the park, elevations range from approximately 2,400 to 3,800 feet and slopes range from 1 to 8 percent. The soils are very deep, stratified coarse sands or have an argillic horizon below sandy or sandy loam horizons. This site experiences rare sheet flooding caused by runoff from adjacent upslope areas. The reference plant community consists of widely spaced creosote bush (*Larrea tridentata*) over big galleta (*Pleuraphis rigida*) and burrobrush (*Ambrosia dumosa*). Additional run-on supports big galleta, and the deep sandy soils support creosote bush. The additional run-on and the argillic horizon that occurs in many of the soils correlated with this site support burrobrush. The production reference value (RV) is 405 pounds per acre but may range from 193 to 590 pounds per acre because of the variability of annual precipitation and the production of grasses and annual forbs.

**R030XB139CA Limy Hill 3-5" P.Z.; /*Larrea tridentata*.** This ecological site occurs on mountain slopes, hillslopes, and steep side slopes of fan remnants with generally very shallow or shallow soils (fig. 26). In the park, elevations range from approximately 2,800 to 3,800 feet and slopes typically range from 8 to 30 percent. The soils typically have an argillic or calcic horizon and a loamy or loamy-skeletal particle-size control section. The vegetation is very sparse creosote bush (*Larrea tridentata*). The production reference value (RV) is 203 pounds per acre but may range from 50 to 350 pounds per acre.

**R030XB140CA Limy Hill 5-7" p.z.; /*Ambrosia dumosa*-*Larrea tridentata*/*Achnatherum speciosum*.** This ecological site occurs on mountain slopes, hillslopes, and steep side slopes of fan remnants with very shallow to very deep soils (fig. 27). In the park, elevations range from approximately 2,300 to 4,300 feet and slopes typically range from 8 to 50 percent. The soils generally have argillic horizons and a loamy or loamy-skeletal particle-size control section. The vegetation is creosote bush



Figure 26.—R030XB139CA Limy Hill 3-5" P.Z. on Seanna soils in map unit 3297.

(*Larrea tridentata*) and burrobush (*Ambrosia dumosa*). This site has properties similar to those of R030XB139CA but has additional moisture (from a lower solar radiation index, a higher precipitation zone, or landscape position) which allows for greater total production and an increase in the amount of burrobush. The production representative value (RV) is 347 pounds per acre but may range from 150 to 450 pounds per acre.

**R030XB148CA Sandy Plain 3-5" P.Z.; /*Larrea tridentata*/Pleuraphis rigida.**

This ecological site occurs on stabilized sand sheets, dunes, and sand sheets on fan remnants (fig. 28). Elevations range from 2,240 to 2,850 feet. Slopes range from 0 to 8 percent. The dominant soils are very deep fine sands that formed from aeolian deposits and exhibit very little soil development. The soils may have an alluvial influence, but aeolian processes dominate. Perennial grasses dominate this site. Big galleta (*Pleuraphis rigida*) is dominant, and Indian rice grass (*Achnatherum hymenoides*) is an important secondary species. Creosote bush (*Larrea tridentata*) is the dominant shrub. Annual forbs are abundant during years of average to above average precipitation. Stable, deep fine sands with little soil development favor perennial grasses and the deep-rooted creosote bush. The production reference value (RV) is relatively high at 1,000 pounds per acre may range from 595 to 1,400 pounds per acre, depending on annual precipitation.

**R030XB156CA Limy 5-7" p.z. (Low Production); /*Larrea tridentata*-*Ambrosia dumosa*.**

This ecological site occurs on fan aprons and fan remnants (fig. 29). Elevations range from 2,460 to 4,270 feet. Slopes range from 2 to 8 percent. The soils may be very shallow over a duripan to very deep. They typically have some degree of development, such as calcic horizons, argillic horizons, and/or duripans. Surface textures are typically sandy, and subsurface textures can be sandy or loamy. This site is similar to R030XB005NV but has lower production because it is





Figure 27.—R030XB140CA Limy Hill 5-7" p.z. on Desertqueen soils in map unit 3297.



Figure 28.—R030XB148CA Sandy Plain 3-5" P.Z. on Bluepoint soils within the adjacent survey area near Johnson Valley. In the park, this site is correlated to Burntstack soils in map unit 4041.



Figure 29.—R030XB156CA Limy 5-7" p.z. (Low Production) on Yuccabutte, warm soils in map unit 4271.

in slightly warmer locations and may have less frequent run-on events. Vegetation is composed of low-growing creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa*). Less dominant species include Mojave yucca (*Yucca schidigera*) and chollas (*Cylindropuntia* spp.). The production reference value (RV) is 280 pounds per acre and may range from 100 to 400 pounds per acre.

**R030XB164CA Thermic Steep South Slopes; /*Encelia farinosa*-*Larrea tridentata*.** This ecological site occurs on south-facing slopes (fig. 30). Elevations range from approximately 2,100 to 3,950 feet. Slopes range from 30 to 60 percent slopes. The soils are shallow gravelly sands over bedrock. This site is strongly dominated by brittlebush (*Encelia farinosa*). Arid topographic positions and shallow soils favor dominance by this drought- and cold-tolerant shrub. The production reference value (RV) is 273 pounds per acre but may range from 145 to 370 pounds per acre, depending on precipitation.

**R030XB172CA Warm Gravelly Shallow Hills; /*Viguiera parishii*-*Larrea tridentata*.** This ecological site occurs on steep stony slopes with shallow to moderately deep soils (fig. 31). Elevations range from 2,100 to 4,720 feet. Slopes typically range from 30 to 75 percent. Stones cover more than 10 percent of the surface. The soil subsurface textures are sandy or loamy. Because of limited soil depth and large rock fragments, the available water capacity is relatively low, ranging from 0.1 inch to 1.4 inches in the upper 40 inches of soil. A high percentage of large surface fragments restricts plant cover, but the additional run-on provided by surface fragments allows for increased diversity. Creosote bush (*Larrea tridentata*) and Parish's goldeneye (*Viguiera parishii*) dominate the site, but a high diversity of other shrub species may be present. The production reference value (RV) is 246 pounds per acre but may range from 105 to 442 pounds per acre, depending on annual precipitation and annual species production.





Figure 30.—R030XB164CA Thermic Steep South Slopes on Ironped soils in map unit 3325.



Figure 31.—R030XB172CA Warm Gravelly Shallow Hills on Lostpalm soils in map unit 4900.

**R030XB174CA Sandy Fan Aprons; *Yucca brevifolia*/*Larrea tridentata*/*Pleuraphis rigida*.** This ecological site occurs on fan aprons (fig. 32). Elevations range from 2,950 to 4,590 feet. Slopes typically range from 2 to 8 percent. The soils are deep or very deep with sand and sandy loam textures. This site typically experiences very rare sheet flow due to flash-flood events. Creosote bush (*Larrea tridentata*), big galleta (*Pleuraphis rigida*), and Joshua tree (*Yucca brevifolia* var. *brevifolia*) dominate the





Figure 32.—R030XB174CA Sandy Fan Aprons on Yander soils (minor component) in map unit 3681.



Figure 33.—R030XB192CA Very Rarely Flooded, Warm Thermic Fan Piedmonts on Bluecut soils in map unit 3683.





Figure 34.—R030XB193CA Very Shallow To Moderately Deep Gravelly Slopes on Desertqueen soils in map unit 3295.

site. The production reference value (RV) is 275 pounds per acre but may range from 131 to 480 pounds per acre, depending on annual precipitation and annual species production.

**R030XB192CA Very Rarely Flooded, Warm Thermic Fan Piedmonts; /*Senna armata*-*Larrea tridentata*/*Pleuraphis rigida*.** This ecological site occurs on fan aprons and fan remnants (fig. 33). Elevations range from approximately 2,100 to 4,200 feet. Slopes range from 2 to 8 percent. This site experiences very rare sheet flooding. The soils are typically very deep. The site is codominated by creosote bush (*Larrea tridentata*) and desertsenna (*Senna armata*). Big galleta (*Pleuraphis rigida*) is also an important species. Sheet flooding supports a diverse plant community, providing additional moisture and establishment opportunities for species such as desertsenna and big galleta. The production reference value (RV) is 244 pounds per acre but may range from 125 to 510 pounds per acre.

**R030XB193CA Very Shallow To Moderately Deep Gravelly Slopes; /*Ambrosia dumosa*-*Viguiera parishii*/*Pleuraphis rigida*.** This ecological site occurs on mountain slopes (fig. 34). Elevations range from 2,300 to 4,820 feet. Slopes range from 15 to 60 percent. The soils are very shallow to moderately deep to weathered gneiss or granitoid-dominant bedrock and typically have an argillic horizon within a depth of 2 to 7 centimeters. They have loamy, fine-loamy, coarse-loamy, and loamy-skeletal textures in the particle-size control section and a low or moderate available water capacity, ranging from 0.9 inch to 3.8 inches in the upper 40 inches. This site is characterized by a diverse shrub assemblage comprised of burrobrush (*Ambrosia dumosa*), Parish's goldeneye (*Viguiera parishii*), Nevada jointfir (*Ephedra nevadensis*), jojoba (*Simmondsia chinensis*), and waterjacket (*Lycium andersonii*); no one species



Figure 35.—R030XB218CA Moderately Deep To Very Deep Loamy Fan Remnants on Gocougs soils in map unit 3695.



Figure 36.—R030XB220CA Very Shallow Duripan Fan Remnants on Minhoyt soils in map unit 4260.



dominates. The production reference value (RV) is 300 pounds per acre but may range from 160 to 730 pounds per acre because of the variable precipitation-dependent production of annuals.

**R030XB218CA Moderately Deep To Very Deep Loamy Fan Remnants; /*Ambrosia dumosa*-*Tetracoccus hallii*.** This ecological site occurs on fan aprons over fan remnants (fig. 35). Elevations range from 2,230 to 4,000 feet. Slopes range from 2 to 8 percent. The soils associated are moderately deep or deep to a pan and/or have a thick argillic horizon or are deep sands that receive additional moisture from very rare sheet flooding. This site is dominated by burrobush (*Ambrosia dumosa*), Hall's shrubby-spurge (*Tetracoccus hallii*), and creosote bush (*Larrea tridentata*). Increased availability of moisture at shallow depths increases the competitive ability of burrobush. This ecological site occurs at the southern edge of the Mojave Desert. Thus, it represents a transition from a warm desert, where winter precipitation is dominant, to a hot desert, where summer precipitation is much more significant. Ancient pediment landforms surround the site, and the area is likely a relict stronghold of a formerly more continuous distribution of Hall's shrubby-spurge, when rainfall was more abundant. The production reference value (RV) is 400 pounds per acre but may range from 270 to 720 pounds per acre.

**R030XB220CA Very Shallow Duripan Fan Remnants; /*Ambrosia dumosa*-*Ziziphus obtusifolia*.** This ecological site occurs on eroded fan remnants (fig. 36). Elevations range from approximately 2,200 to 3,400 feet. Slopes range from 2 to 8 percent. The soils are very shallow to a cemented duripan, and soil surfaces have a high amount of gravel- and cobble-sized, strongly cemented durinodes. This site occurs at the southern edge of the Mojave Desert (the Mojave Desert-Colorado Desert or MLRA 30-31 boundary). Thus, it represents a transition from a warm desert, where winter precipitation is dominant, to a hot desert, where summer precipitation is much more significant. The combination of very shallow soils, pavement-like durinodic soil surfaces, the relatively high amounts of summer precipitation, and a warm climate produces a unique and diverse plant community. Vegetation is sparse and open with an aggregated distribution. The site is dominated by burrobush (*Ambrosia dumosa*), lotebush (*Ziziphus obtusifolia*), and Hall's shrubby-spurge (*Tetracoccus hallii*). Desert polygala (*Polygala acanthoclada*) is a distinguishing shrub for this site. Although the very shallow soils limit annual forb production, a high diversity of native annual forbs occurs on this site. The production reference value (RV) is 250 pounds per acre, which is low relative to that of surrounding landforms.

**R030XB221CA Loamy Fan Remnants And Pediments; /*Coleogyne ramosissima*-*Ambrosia dumosa*.** This ecological site occurs on eroded fan remnants and dissected pediments (fig. 37). Elevations range from 2,230 to 4,040 feet. Slopes generally range from 2 to 8 percent but can range to 30 percent on side slopes of fan remnants and on eroded pediments. The soils are shallow to deep over bedrock or a duripan. They have loamy subsurface layers and a well developed argillic horizon beginning within a depth of 12 inches. The reference plant community is codominated by blackbrush (*Coleogyne ramosissima*) and burrobush (*Ambrosia dumosa*), and secondary shrub diversity is high. This site occurs at elevations relatively low for blackbrush in the Mojave Desert. A well developed argillic horizon significantly increases the available water capacity, which allows blackbrush to be a dominant species despite low elevations. The argillic horizon also enhances habitat for the shallow-rooted burrobush. The transitional climatic location and dissected topography enhance shrub diversity. The production reference value (RV) is 297 pounds per acre but may range from 195 to 402 pounds per acre, depending on annual precipitation.

**R030XB225CA Warm Sloping Pediments; /*Tetracoccus hallii*-*Ambrosia dumosa*.** This ecological site occurs on dissected pediments (fig. 38). Elevations range from 2,740 to 4,040 feet. Slopes range from 4 to 50 percent. The soils are very shallow or shallow over bedrock. This site occurs at the southern edge of the



**Figure 37.—R030XB221CA Loamy Fan Remnants And Pediments on Popups soils (minor component) in map unit 4260.**



**Figure 38.—R030XB225CA Warm Sloping Pediments on Stranger soils in map unit 4260.**





Figure 39.—R030XB228CA Warm Shallow Pediments on Stranger soils in map unit 4825.

Mojave Desert (the Mojave Desert-Colorado Desert or MLRA 30-31 boundary). Thus, it represents a transition from a warm desert, where winter precipitation is dominant, to a hot desert, where summer precipitation is much more significant. The reference plant community is weakly dominated by Hall's shrubby-spurge (*Tetradlea hallii*) and burrobush (*Ambrosia dumosa*), and secondary shrub diversity is high. The production reference value (RV) is 325 pounds per acre but may range from 230 to 530 pounds per acre, depending on annual precipitation and annual forb production.

**R030XB228CA Warm Shallow Pediments; /*Larrea tridentata*-*Ambrosia dumosa*/Malacothrix glabrata.** This ecological site occurs on pediments located relatively far from receding mountain fronts and thus subject to relatively low rates of erosion (fig. 39). Elevations range from 2,310 to 3,330 feet. Slopes typically range from 2 to 15 percent. The soils are very shallow or shallow. This site is dominated by creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa*). Relative to surrounding fan aprons, the site has a high diversity of secondary shrubs. Soil temperatures are at the warmest range of the warm thermic soil temperature regime. Warmer temperatures and relatively low levels of erosion support dominance by creosote bush and burrobush. A low available water capacity in the shallow soils reduces productivity relative to surrounding fan aprons. Localized runoff from dissected topography provides microsites for a greater diversity of species. The production reference value (RV) is 195 pounds per acre but may range from 90 to 305 pounds per acre.

#### LRU XD, Hyperthermic Soil Temperature Regime

LRU XD occurs on the eastern side of California, where MLRAs 30 and 31 abut. Elevations range from 400 to 2,200 feet on average but may range to 4,000 feet on southern exposures. Precipitation ranges from 1 to 6 inches per year but averages between 3 to 5 inches. This LRU is characterized primarily by extreme aridity, hot temperatures, hyperthermic soil temperatures, and low stature of widely spaced vegetation. Temperatures can reach over 110 degrees F for several weeks in July and



Figure 40.—R030XD001CA Hyperthermic Dry Hills on Jadestorm, cool soils in map unit 1230.



Figure 41.—R030XD003CA Hyperthermic Steep South Slopes on Meccapass soils in map unit 1242.





Figure 42.—R030XD004CA Low-Production Hyperthermic Hills on Descent soils in map unit 2130.

August. Summer precipitation falls between July and September, ranging from 20 to 33 inches in the form of rain. Winter precipitation falls starting in December and ends between February and March, ranging from 56 to 70 inches, also mostly in the form of rain. Vegetation is primarily small, widely spaced, low-producing creosote bush (*Larrea tridentata*), burrobush (*Ambrosia dumosa*), and brittlebush (*Encelia farinosa*).

**R030XD001CA Hyperthermic Dry Hills; /*Larrea tridentata*-*Ambrosia dumosa*/*Pectocarya recurvata*-*Malacothrix glabrata*.** This ecological site occurs on mountain slopes, hillslopes, and steep side slopes of fan remnants, on dominantly north-facing aspects (fig. 40). Elevations range from approximately 1,000 to 2,400 feet. At the higher elevations, this site may occur on all aspects. Slopes range from 15 to 75 percent. The soils are typically skeletal, have gravel surface textures, and range from very shallow to deep. This site is dominated by creosote bush (*Larrea tridentata*), and burrobush (*Ambrosia dumosa*) is an important secondary shrub. North-facing landscape positions on hyperthermic slopes favor dominance by creosote bush and burrobush. The production reference value (RV) is 255 pounds per acre but may range from 70 to 431 pounds per acre, depending on precipitation and annual forb production.

**R030XD003CA Hyperthermic Steep South Slopes; /*Encelia farinosa*-*Larrea tridentata*.** This ecological site occurs on steep, arid side slopes of fan remnants, hillslopes, and mountain slopes (fig. 41). In the park, elevations range from 390 to 3,990 feet, extending slightly below the typical range for the LRU. Slopes typically range from 30 to 60 percent. This site is associated with hot landscape positions and typically occurs on south-facing aspects. At the lower elevations, however, it may occur on all aspects. The soils are typically skeletal, have gravel surface textures, and range from very shallow to deep. This site is dominated by brittlebush (*Encelia farinosa*), and creosote bush (*Larrea tridentata*) is an important secondary shrub. The production reference value (RV) is 257 pounds per acre but may range from 159 to 356 pounds per acre, depending on precipitation.

**R030XD004CA Low-Production Hyperthermic Hills; /*Larrea tridentata*/*Chaenactis fremontii*.** This ecological site occurs on very dry mountain slopes, hillslopes, and steep side slopes of fan remnants (fig. 42). Elevations range from 570



**Figure 43.—R030XD006CA Dry Deep Sandy Fan Aprons on the minor Pintobasin soils in map unit 1522.**



**Figure 44.—R030XD008CA Hyperthermic Sandhill on the dominant Dalelake component in map unit 2716.**

to 3,990 feet. Slopes range from 8 to 75 percent. The soils have gravel or channery surface textures and a high content of large (greater than 3 inches in diameter) rock fragments, by volume. Vegetation is dominated by very sparse, small creosote bush (*Larrea tridentata*). Annual forbs contribute 50 to 80 percent of annual production during years of average to above average precipitation. A very dry climate, steep slopes, and rocky soils that have a low available water capacity restrict the potential vegetation to this sparse community. The production reference value (RV) is 149 pounds per acre but may range from 26 to 428 pounds per acre, depending on precipitation and annual forb production.

**R030XD006CA Dry Deep Sandy Fan Aprons; /*Larrea tridentata*/Plantago ovata.** This ecological site occurs on alluvial fans and fan aprons (fig. 43). Elevations range from 670 to 2,620 feet. Slopes range from 0 to 8 percent. The soils are composed of very deep, stratified layers of sand. This site tends to occupy distal fan positions far from sources of run-on and typically has no sheet flow from flash-flood events. Vegetation is sparse and dominated by low-statured creosote bush (*Larrea tridentata*). The hyperthermic climate, deep sandy soils, and lack of additional run-on from sheet flooding result in a very dry and sparsely vegetated community. The deep-rooted creosote bush is the only shrub capable of tolerating the extremely arid conditions. The production reference value (RV) is 67 pounds per acre but may range from 21 to 191 pounds per acre, depending on annual precipitation and annual forb production.

**R030XD008CA Hyperthermic Sandhill; /*Larrea tridentata*-*Ambrosia dumosa*/Pleuraphis rigida.** This ecological site occurs on stabilized dunes and steep sand sheets (fig. 44). Elevations range from 750 to 2,620 feet. Slopes range from 8 to 30 percent. The soils are very deep fine sands that formed from eolian deposits and exhibit very little soil development. The reference community is dominated by big galleta (*Pleuraphis rigida*). Creosote bush (*Larrea tridentata*), dyebush (*Psoralea arguta*), and burrobush (*Ambrosia dumosa*) are common secondary species. Annual forbs are abundant during years of average to above average precipitation. The semi-stabilized, deep, fine sands provide optimum habitat for big galleta, which colonizes and stabilizes these eolian habitats with rhizomatous growth. The production reference value (RV) is 562 pounds per acre but may range from 250 to 905 pounds per acre, depending on precipitation and the resulting annual forb production.

**R030XD014CA Hyperthermic Sandy Plains; /*Larrea tridentata*/Pleuraphis rigida.** This ecological site occurs on semi-stabilized sand sheets (fig. 45). Elevations range from 1,150 to 1,970 feet. Slopes range from 2 to 15 percent. The dominant soils are very deep, fine sands that formed from eolian deposits and exhibit very little soil development. The soils may have an alluvial influence, but eolian processes dominate. The reference community is dominated by big galleta (*Pleuraphis rigida*), and creosote bush (*Larrea tridentata*) is the dominant shrub. Annual forbs are abundant during years of average to above average precipitation. The semi-stabilized, deep, fine sands provide optimum habitat for big galleta, which colonizes and stabilizes these aeolian habitats with rhizomatous growth. The production reference value (RV) is 470 pounds per acre but may range from 280 to 625 pounds per acre, depending on precipitation and the resulting annual forb production.

**R030XD015CA Hyperthermic Fans; /*Larrea tridentata*-*Ambrosia dumosa*.** This ecological site occurs on gently sloping alluvial fans, fan aprons, and fan remnants (fig. 46). Elevations range from 660 to 2,810 feet. Slopes generally range from 0 to 8 percent. The soils are typically very deep but may be shallow to a duripan where there is enough additional run-on. This site typically has rare sheet flow due to flash-flood events. It is codominated by creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa*). The production reference value (RV) is 139 pounds per acre but may range from 75 to 291 pounds per acre, depending on annual precipitation.





**Figure 45.—R030XD014CA Hyperthermic Sandy Plains on Dalelake soils in map unit 2067.**



**Figure 46.—R030XD015CA Hyperthermic Fans on Pintobasin soils in map unit 1524.**



Figure 47.—R030XD023CA Hyperthermic Dissected Shallow Pediment on Marbolite soils (minor component) in map unit 2820.

**R030XD023CA Hyperthermic Dissected Shallow Pediment; /*Psorothamnus arborescens*-*Senna armata*.** This ecological site occurs on dissected pediments (fig. 47). Elevations range from 950 to 2,800 feet. Slopes range from 2 to 30 percent. The soils are very shallow or shallow over unweathered bedrock. This site is dominated by Mojave indigobush (*Psorothamnus arborescens*), desert senna (*Senna armata*), and burrobush (*Ambrosia dumosa*). It also has a high diversity of other shrubs. Hyperthermic soil temperatures and shallow soils limit annual production but favor habitat for burrobush. The dissected topography and shallow soils provide areas of localized runoff, which support desert senna and Mojave indigobush as well as a diversity of shrubs higher than that of surrounding fan aprons. The production reference value (RV) is 164 pounds per acre but may range from 68 to 221 pounds per acre, depending on annual precipitation.

**R030XD025CA Hyperthermic Sandsheets; /*Larrea tridentata*-*Psorothamnus emoryi*/*Plantago ovata*-*Chaenactis fremontii*.** This ecological site occurs on stabilized sand sheets (fig. 48). Elevations range from 710 to 2,460 feet. Slopes range from 0 to 8 percent. The dominant soils are very deep, fine sands that formed from aeolian deposits and exhibit very little development. They may have an alluvial influence but aeolian processes dominate. Hyperthermic soil temperature regimes and stable fine sands determine the vegetation dynamics of this site. Creosote bush (*Larrea tridentata*) is dominant. Dyebrush (*Psorothamnus emoryi*) and burrobush (*Ambrosia dumosa*) are important secondary species. Annual forbs are abundant during years of average to above average precipitation. The production reference value (RV) is relatively low at 140 pounds per acre but may range from 40 to 270 pounds per acre, depending on precipitation and the resulting annual forb production.





Figure 48.—R030XD025CA Hyperthermic Sandsheets on Dalelake soils in map unit 2715.



Figure 49.—R030XD039CA Coarse Gravelly Fans on Carrizo soils in map unit 1542.





Figure 50.—R030XD040CA Hyperthermic Steep North Slopes on Ironlung soils in map unit 1250.

**R030XD039CA Coarse Gravelly Fans; /*Larrea tridentata*-*Encelia farinosa*.**

This ecological site occurs on fan aprons, alluvial fans, and fan remnants (fig. 49). Elevations range from 560 to 3,610 feet. Slopes range from 2 to 15 percent. The soils are very deep, typically have a high amount of surface gravel and cobbles, and have gravelly to extremely gravelly subsurface textures. This site typically has very rare surface flooding. It occurs at the southern edge of the Mojave Desert (the Mojave Desert–Colorado Desert or MLRA 30–31 boundary). Thus, it represents a transition from a warm desert, where winter precipitation is dominant, to a hot desert, where summer precipitation is much more significant and frosts are rare. This site is dominated by creosote bush (*Larrea tridentata*) and brittlebush (*Encelia farinosa*). A hyperthermic climate with low frost prevalence, deep gravelly soils, and very rare surface flooding determine the vegetative community of this site. Water rapidly permeates through the coarse soils to deep soil layers. The deep-rooted, evergreen creosote bush accesses deep water while tolerating extreme aridity at near-surface depths. The very rare flooding and low incidence of frost promote dominance by brittlebush. The production reference value (RV) is 186 pounds per acre but may range from 120 to 318 pounds per acre, depending on annual precipitation.

**R030XD040CA Hyperthermic Steep North Slopes; /*Ambrosia dumosa*-*Viguiera parishii*.** This ecological site occurs on dissected mountain slopes (fig. 50). Elevations range from 1,150 to 3,700 feet. Slopes range from 30 to 75 percent. Exposed bedrock and small gullies are common across the slope, contributing to high topographical diversity. At the lower elevations, this site tends to occur on cooler, north- and east-facing aspects. The dominant soils range from very shallow to moderately deep, are sandy, and have gravel and cobble surface textures. This site occurs at the southern edge of the Mojave Desert (the Mojave Desert–Colorado Desert or MLRA 30–31 boundary) and receives relatively high amounts of summer precipitation. It is weakly



Figure 51.—R030XD041CA Channeled Warm Alluvial Fans on Pintobasin soils in map unit 1526.

dominated by burrobush (*Ambrosia dumosa*) and Parish's goldeneye (*Viguiera parishii*). It also has a high diversity of other shrub species. The sandy soils on steep slopes, a highly dissected topography, proximity to the MLRA 31 boundary, and a high amount of surface rock fragments that increases run-on create the diverse shrub community that characterizes this ecological site. The cooler landscape positions restrict brittlebush, which is abundant on the adjacent warmer slopes. The production reference value (RV) is 224 pounds per acre but may range from 145 to 436 pounds per acre, depending on precipitation and localized topographical conditions.

**R030XD041CA Channeled Warm Alluvial Fans; /*Larrea tridentata*-*Ambrosia dumosa*.** This ecological site occurs on channeled fan aprons and fan remnants in upper fan positions (fig. 51). Elevations range from 950 to 2,390 feet. Representative slopes are 2 to 4 percent. The soils are typically very deep and have sandy textures. This site is dominated by creosote bush (*Larrea tridentata*). Burrobush (*Ambrosia dumosa*) and brittlebush (*Encelia farinosa*) are important secondary species. The hyperthermic climate, upper slope positions, channeled fan topography, and rare or occasional surface flooding determine the vegetative community of this site. This site is more productive and diverse than those on landforms at the same elevation with less additional moisture. The production reference value (RV) is 242 pounds per acre but may range from 160 to 390 pounds per acre, depending on annual precipitation and annual forb production.

**R030XD042CA Hyperthermic Shallow to Moderately Deep Fan Remnants; /*Larrea tridentata*-*Ambrosia dumosa*/*Cryptantha*.** This ecological site occurs on stable, undulating fan remnants and fan aprons over fan remnants (fig. 52). Elevations range from 960 to 2,560 feet. Representative slopes are 0 to 15 percent. The dominant soils have a high degree of horizon development and typically have a root- and water-limiting, silica and/or calcic cemented duripan at shallow to moderately deep depths. Vegetation is very sparse, patchy, and restricted to breaks in the remnant surface. This site is dominated by creosote bush (*Larrea tridentata*). Burrobush (*Ambrosia*



*dumosa*) and white ratany (*Krameria grayi*) are sparse. The root-limiting soil horizons coupled with hyperthermic soil temperatures and low amounts of precipitation limit the production and density of shrubs. Shrub density is less than 100 individuals per acre. The production reference value (RV) is 45 pounds per acre but may range from 20 to 85 pounds per acre, depending on precipitation and annual forb production.

**R030XD152CA, Hyperthermic Saline Hill; /*Atriplex hymenelytra*-*Encelia farinosa*.** This ecological site occurs on basalt hills and lava flows (fig. 53). Elevations range from 980 to 2,200 feet. Slopes range from 15 to 30 percent. The soils formed in colluvium and residuum from basalt and are very shallow over bedrock. The surface texture is gravel. Calcium carbonate accumulations on the soil surface are common. Vegetation is very sparse, covers a low amount of the site, and has low productivity. This site is dominated by desertholly (*Atriplex hymenelytra*). Brittlebush (*Encelia farinosa*) and creosote bush (*Larrea tridentata*) are secondary shrubs. The hyperthermic, very shallow soils that have low permeability, a high content of calcium carbonate, and shallow depths are the most important abiotic factors determining this ecological site. Harsh edaphic conditions with high moisture stress restrict plant production and the amount of the site a plant covers. They limit dominance to the very drought-tolerant, salt-secreting desertholly. The production reference value (RV) is 46 pounds per acre but may range from 25 to 68 pounds per acre, depending on precipitation and annual forb production.

#### **LRU XE, Aridic Bordering on Xeric Soil Moisture Regime**

LRU XE occurs only in California at the transition zone between MLRA 20, the Southern California Mountains, and MLRA 30. Elevations range from 3,400 to 5,800 feet. Precipitation ranges from 8 to 10 inches per year. This LRU is characterized primarily by cool thermic and mesic soil temperature regimes and aridic bordering on xeric soil moisture regimes. Precipitation occurs mostly in winter, with approximately 85 percent falling between December and February, transitioning from rain in the fall to partly snow in the winter. Snow can range from 1 to 6 inches per year. Vegetation is highly productive and vigorous for the Mojave Desert and includes singleleaf pinyon



Figure 52.—R030XD042CA Hyperthermic Shallow to Moderately Deep Fan Remnants on Perurose soils in map unit 2100.



**Figure 53.—R030XD152CA Hyperthermic Saline Hill on Missionwell, strongly alkaline soils (minor component) in map unit 1410.**



**Figure 54.—R030XE191CA Dry Sandy Mountain Slopes on Smithcanyon soils in map unit 3294.**





Figure 55.—R030XE196CA Sandy Xeric-Intergrade Slopes on Smithcanyon soils in map unit 3293.

(*Pinus monophylla*), California juniper (*Juniperus californica*), Muller oak (*Quercus cornelius-mulleri*), bigberry manzanita (*Arctostaphylos glauca*), desert needlegrass (*Achnatherum speciosum*), and Sandberg bluegrass (*Poa secunda*).

**R030XE191CA Dry Sandy Mountain Slopes; *Quercus cornelius-mulleri*-*Pinus monophylla*.** This ecological site occurs on mountain slopes (fig. 54). Elevations range from 3,400 to 5,800 feet. Slopes range from 30 to 75 percent. The soils are very shallow or shallow and have a xeric moisture regime bordering on aridic. This site is associated with dry landscape positions (such as southern exposures and wind-desiccated ridges) that do not support a high amount of tree or shrub cover relative to cooler and/or moister topographic positions. Singleleaf pinyon (*Pinus monophylla*) and Muller oak (*Quercus cornelius-mulleri*) dominate this site. A sparse understory of perennial grasses, subshrubs, and secondary shrubs is also present. Sparse vegetation cover increases soil erosion on these steep slopes, which results in maintaining a low amount of cover. The production reference value (RV) is 375 pounds per acre but may range from 195 to 660 pounds per acre, depending on precipitation and the annual production of forbs and non-native grasses.

**R030XE196CA Sandy Xeric-Intergrade Slopes; *Pinus monophylla*-*Juniperus californica*/*Quercus cornelius-mulleri*-*Arctostaphylos glauca*.** This ecological site occurs on hills and mountain slopes (fig. 55). Elevations range from 3,400 to 5,600 feet. Slopes range from 15 to 50 percent. The soils are typically shallow and have surface boulders and bedrock outcrops across the slope. Large rock fragments cover a significant amount of the soil surface (reference value of more than 5 percent). Boulders and large rock fragments contribute to soil stability and provide additional surface run-on. This increases moisture availability, which supports a high diversity



Figure 56.—R030XE200CA Xeric Very Deep Sandy Fan Aprons On Pediments on Smithcanyon soils in map unit 4630.

of shrub and tree species that cover a relatively high amount of the site. Singleleaf pinyon (*Pinus monophylla*) and Muller oak (*Quercus cornelius-mulleri*) dominate. Important secondary species include California juniper (*Juniperus californica*), bigberry manzanita (*Arctostaphylos glauca*), blackbrush (*Coleogyne ramosissima*), and desert needlegrass (*Achnatherum speciosum*). The production reference value (RV) is 590 pounds per acre but may range from 230 to 950 pounds per acre, depending on annual precipitation and annual species production.

**R030XE200CA Xeric Very Deep Sandy Fan Aprons On Pediments; *Pinus monophylla*/*Coleogyne ramosissima*-*Quercus cornelius-mulleri*.** This ecological site occurs on undulating fan aprons on pediments (fig. 56). Elevations range from approximately 4,400 to 5,200 feet. Slopes range from 4 to 8 percent. The soils are typically very deep sands on slopes among exposed bedrock and rock outcrops. Singleleaf pinyon (*Pinus monophylla*), Muller oak (*Quercus cornelius-mulleri*), and California juniper (*Juniperus californica*) dominate the overstory. Blackbrush (*Coleogyne ramosissima*) is the dominant low shrub. The production reference value (RV) is 422 pounds per acre but may range from 171 to 570 pounds per acre, depending on precipitation and the annual production of forbs and non-native grasses.

### Lower Colorado Desert Major Land Resource Area (MLRA 31)

**R031XY001CA Limy Hill 4-6" p.z.; *Larrea tridentata*-*Ambrosia dumosa*/*Plantago ovata*.** This ecological site occurs on north-facing hills and, rarely, on side slopes of fan remnants (fig. 57). Elevations range from 1,280 to 1,800 feet. Slopes typically range from 15 to 50 percent. The soils are very shallow and have surface layers of very gravelly loamy fine sand or very gravelly loamy sand and similar subsurface textures. Sparse creosote bush (*Larrea tridentata*) and burrobrush (*Ambrosia dumosa*) are present. North aspects retain water longer than southern aspects; in this hot climate burrobrush is more productive on these northern slopes.



The production reference value (RV) is 175 pounds per acre but may range 100 to 250 pounds per acre, depending on precipitation and annual forb production.

**R031XY002CA Desert Pavement 2-4" p.z.; /*Larrea tridentata*-*Encelia farinosa*/*Plantago ovata*-*Chorizanthe rigida*.** This ecological site occurs on fan remnants, ballena summits, and fan aprons (fig. 58). Elevations range from 460 to 1,720 feet. Slopes range from 0 to 8 percent. This site is defined by the presence of desert pavement surfaces underlain by a fine eolian vesicular layer. The desert pavement surface is composed of interlocking rock fragments. It limits water infiltration and plant establishment, thus limiting the production and diversity of vegetation. Desert pavement rock fragments are often covered with desert patina, a thin varnish of clay, manganese, and iron oxides. Vegetation is dominated by very sparse creosote bush (*Larrea tridentata*), which is confined to breaks in the pavement surface. The production reference value (RV) is 50 pounds per acre but may range from 25 to 125 pounds per acre, depending on precipitation and annual forb production.

**R031XY003CA Steep South Slope 2-4" p.z.; /*Encelia farinosa*-*Larrea tridentata*/*Eriogonum deflexum*-*Plantago ovata*.** This ecological site occurs primarily on south-facing hills but may also occur on ballenas and steep side slopes of fan remnants (fig. 59). Elevations range from 460 to 2,030 feet. Slopes range from 15 to 50 percent. The soils are typically very shallow or shallow and have a loamy-skeletal particle-size control section but are very deep on ballenas and fan remnants. Creosote bush (*Larrea tridentata*) and brittlebush (*Encelia farinosa*) dominate the site. The production reference value (RV) is 250 pounds per acre but may range from 100 to 400 pounds per acre, depending on precipitation and annual forb production.



Figure 57.—R031XY001CA Limy Hill 4-6" p.z. in the Colorado Desert Area, a survey area adjacent to the park. This site occurs on the minor Rizzo soils in map units 2408 and 2410 along the southern boundary of the park.



Figure 58.—R031XY002CA Desert Pavement 2-4" p.z. on Deprave soils in map unit 2090.

**R031XY004CA Limy Hill 2-4" p.z.; /*Larrea tridentata*/Plantago ovata-Eriogonum deflexum.** This ecological site occurs on side slopes of fan remnants and hills (fig. 60). Elevations range from 460 to 1,800 feet. Slopes typically range from 8 to 30 percent. The soils are typically very deep but may be moderately deep over a duripan or very shallow over bedrock on hills. They commonly have calcium carbonate accumulations. Creosote bush (*Larrea tridentata*) dominates and is small and widely spaced. Shrub diversity is very low. The production reference value (RV) is 75 pounds per acre but may range from 25 to 125 pounds per acre.

**R031XY006CA Limy 2-4" p.z.; /*Larrea tridentata*-Krameria grayi/Plantago ovata.** This ecological site occurs on remnants, fan aprons, and inset fans (fig. 61). Elevations range from 440 to 1,770 feet. Slopes generally range from 2 to 8 percent. The soils are typically very deep and commonly have calcic horizons, argillic horizons, or carbonates. The surface has 35 to 95 percent gravel, and desert pavement surfaces may be developing in some areas. Sparse creosote bush (*Larrea tridentata*) dominates the vegetation. The production reference value (RV) is 75 pounds per acre but may range from 50 to 100 pounds per acre, depending on precipitation and annual forb production.

**R031XY009CA Gravelly Fan Remnants And Fan Aprons; /*Larrea tridentata*-*Psoralea schottii*/Chorizanthe brevicornu.** This ecological site occurs on stable, broad fan remnants and fan aprons (fig. 62). Elevations range from 540 to 2,620 feet. Slopes range from 2 to 15 percent. The soils are very deep, have sandy and gravelly textures, have a high amount of surface gravel and cobbles, and have a high percentage of subsurface rock fragments, by volume. Shrubs are widely spaced. Creosote bush (*Larrea tridentata*) and Schott's dalea (*Psoralea schottii*) dominate the site. Very deep soils and hyperthermic soil temperatures favor dominance by the deep-rooted creosote bush. The gravelly soils and their high amount of surface rock fragments and increased rates of run-on enhance habitat for Schott's dalea. The production reference value (RV) is 161 pounds per acre but may range from 50 to 344 pounds per acre, depending on precipitation and annual forb production.





Figure 59.—R031XY003CA Steep South Slope 2-4" p.z. on Jadestorm soils in map unit 2840.



Figure 60.—R031XY004CA Limy Hill 2-4" p.z. in the Colorado Desert Area, a survey area adjacent to the park. This site occurs on the minor Rizzo, moderately steep soils (map unit 2403) and on the minor Deprave, moderately steep soils (map unit 2090) along the southern boundary of the park.





Figure 61.—R031XY006CA Limy 2-4" p.z. on Roostertail soils in map unit 2091.



Figure 62.—R031XY009CA Gravelly Fan Remnants And Fan Aprons on Rizzo soils in map unit 2090.



Figure 63.—R031XY030CA Extremely Stony Fan Remnants on Rizzo, rubbly soils in map unit 2121.

**R031XY030CA Extremely Stony Fan Remnants; /*Cylindropuntia bigelovii*-*Encelia farinosa*.** This ecological site occurs on extremely cobbly and stony alluvial fans and fan remnants that are located near the base of mountain slopes (fig. 63). Elevations range from 1,230 to 2,620 feet. Slopes range from 4 to 15 percent. The soils are typically very deep gravelly sands, have a high amount of surface gravel and cobbles, and have a high volume of subsurface rock fragments. Dense teddybear cholla (*Cylindropuntia bigelovii*) colonies are characteristic of this ecological site. Brittlebush (*Encelia farinosa*) and creosote bush (*Larrea tridentata*) are the dominant species. Shrub species are highly diverse and cover a high amount of the site. Run-on from nearby mountain slopes and from the large rock fragments that dominate the soil surface disperse teddybear cholla propagules, which maintain cholla colonies. Additional run-on and a heterogeneous soil surface also provide microsites that support a high diversity of shrub species covering a high amount of the site relative to adjacent landforms. Deep, coarse soils and hyperthermic soil temperatures favor dominance by the deep-rooted creosote bush, while additional run-on and a very arid climate support dominance by brittlebush. The production reference value (RV) is 290 pounds per acre but ranges from 150 to 455 pounds per acre, depending on precipitation and annual forb production.

**R031XY200CA Rarely Flooded Fans; /*Larrea tridentata*-*Encelia farinosa*.** This ecological site occurs on very rarely flooded or rarely flooded fan aprons and alluvial fans (fig. 64). Elevations range from 540 to 2,730 feet. Slopes range from 2 to 8 percent. The soils are very deep and sandy. Brittlebush (*Encelia farinosa*) and creosote bush (*Larrea tridentata*) are dominant. The deep, coarse soils and hyperthermic soil temperatures favor dominance by the deep-rooted creosote





**Figure 64.—R031XY200CA Rarely Flooded Fans on Carsitas soils in map unit 1555.**



**Figure 65.—R031XY201CA Cobbly Fan Remnants on Rizzo soils in map unit 1504.**

bush, while rare flooding and rapid evaporation from the sandy surface layer favor the shallow-rooted brittlebush. The production reference value (RV) is 218 pounds per acre but may range from 100 to 396 pounds per acre, depending on annual precipitation and annual forb production.





Figure 66.—R031XY010CA Valley Wash on Carsitas soils in map unit 2420.

**R031XY201CA Cobbly Fan Remnants; /*Larrea tridentata*-*Encelia farinosa*.** This ecological site occurs on cobbly fan remnants (fig. 65). Elevations range from 1,130 to 2,890 feet. Slopes range from 4 to 15 percent. The soils are very deep to shallow over a duripan. Soil surfaces are covered with cobbles and stones with patches of gravel-dominated areas. The high amount of large rock fragments on the surface can limit shrub density but also provides additional run-on, which increases the diversity of shrubs and cactuses. Creosote bush (*Larrea tridentata*) and brittlebush (*Encelia farinosa*) dominate the site. Blue paloverde (*Parkinsonia florida*) and desert ironwood (*Olneya tesota*) occur sporadically, and a diversity of cactus species are present. The production reference value (RV) is 161 pounds per acre but may range from 60 to 230 pounds per acre.

**R031XY010CA Valley Wash; *Parkinsonia florida*-*Chilopsis linearis*/Acacia greggii-Hymenoclea salsola/Chamaesyce albomarginata-Oenothera deltoides.** This ecological site occurs on large, broad, frequently flooded, valley bottom drainageways and channels, distal from the mountains (fig. 66). Because it is distal from the mountains, energy and flow volume have dissipated from the stream. Gravel and sands dominate the surface of the site, with generally less than 5 percent larger rock fragments. Elevations range from 460 to 1,740 feet. Slopes range from 0 to 8 percent. The presence of blue paloverde (*Parkinsonia florida*) and desert willow (*Chilopsis linearis*) indicate that water infiltrates deep into the soil, providing a deep water source. Catclaw acacia (*Acacia greggii*) and burrobrush (*Hymenoclea salsola*) are common.

**R031XY019CA Coarse Gravelly Wash; *Parkinsonia florida*/Encelia farinosa-Acacia greggii/Chamaesyce albomarginata.** This ecological site is associated with mid-sized drainages that are confined between fan aprons or fan remnants (fig. 67). The confinement concentrates flow and reduces the diversity of flooding regimes within the drainageway. This site is subject to frequent flooding due to flash-flood events. Elevations range from 470 to 1,740 feet. Slopes range from 0 to 8 percent.



Figure 67.—R031XY019CA Coarse Gravelly Wash on Rizzo soils in map unit 2403.

Catclaw acacia (*Acacia greggii*), creosote bush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), and desert lavender (*Hyptis emoryi*) are dominant. Blue paloverde (*Parkinsonia florida*) is scattered along the drainageway.

**R031XY021CA Very Gravelly Wash; /*Larrea tridentata*-*Encelia farinosa*/*Chamaesyce albomarginata*-*Plantago ovata*.** This ecological site has rare to occasional flood events and occurs on interfluvies and inset fans and on fan remnants with desert pavement surfaces (fig. 68). The soils are very deep and have a loamy-skeletal or sandy-skeletal particle-size control section. Elevations range from 69 feet, outside Joshua Tree National Park, to 1,720 feet, within the park; the lowest elevation is 520 feet. Slopes generally range from 2 to 8 percent. Creosote bush (*Larrea tridentata*) is dominant, and brittlebush (*Encelia farinosa*) codominant. Desert lavender (*Hyptis emoryi*) and white ratany (*Krameria grayii*) commonly occur.

**R031XY026CA Large, High Intensity, Frequently Flooded Ephemeral Stream; *Olneya tesota*-*Parkinsonia florida*/*Hymenoclea salsola*-*Hyptis emoryi*.** This ecological site is associated with third-order or larger streams situated close to mountain slopes where there are high-intensity inputs of water (fig. 69). Elevations range from 540 to 2,660 feet. Slopes range from 2 to 8 percent. Large, frequent flash-flood events create a wide active channel that is barren or has scattered smoketree (*Psoralea argus*). The active channel has a shallow braided pattern that spreads across a broad, relatively level drainageway. The drainage contains associated occasionally flooded sediment bars with higher relief that have a higher diversity of shrubs and forbs. The soils are very deep and dominantly are very gravelly coarse sand. This site is distinguished by a large active channel and by a relatively high amount of desert ironwood (*Olneya tesota*) and blue paloverde (*Parkinsonia florida*).

**R031XY029CA Frequently Flooded, Confined Ephemeral Stream; *Olneya tesota*/*Larrea tridentata*-*Encelia farinosa*/*Pleuraphis rigida*-*Chaenactis fremontii*.** This ecological site is associated with first-order ephemeral streams, which occur





Figure 68.—R031XY021CA Very Gravelly Wash on ???



Figure 69.—R031XY026CA Large, High Intensity, Frequently Flooded Ephemeral Stream on Carsitas soils in map unit 2409.





**Figure 70.—R031XY029CA Frequently Flooded, Confined Ephemeral Stream on Rizzo, frequently flooded soils in map unit 2121.**



**Figure 71.—R031XY034CA Gravelly, Braided, Ephemeral Stream on Rizzo soils in map unit 2404.**



Figure 72.—R031XY202CA Stony, Occasionally Flooded Ephemeral Stream on Rizzo soils in map unit 1504.

in confined drainageways that dissect stable fan remnants and ballenas with desert pavement surfaces (fig. 70). These drainageways have frequent, low-intensity, flash-flood events. Elevations range from 460 to 2,230 feet. Slopes range from 0 to 15 percent. The soils are very deep, very gravelly sandy loams. Most of the surface is covered by coarse gravel and cobbles but patches of sand deposits occur. These patches are colonized and maintained by vegetation. This site is dominated by ironwood (*Olneya tesota*), creosote bush (*Larrea tridentata*), and brittlebush (*Encelia farinosa*). Big galleta (*Pleuraphis rigida*) is an important species on the sandy deposits.

**R031XY034CA Gravelly, Braided, Ephemeral Stream; *Parkinsonia florida*-*Olneya tesota*/Hymenoclea salsola-Hyptis emoryi.** This ecological site occurs on mid portions of the fan piedmont, below third-order or larger drainages, where flow from flash-flood events dissipates and sediments are deposited on the fans (fig. 71). Multiple braided channels develop on this site because low stream velocity and sediment deposition cause channel migrations. The majority of this site is occasionally flooded, but it includes a small main channel that is more frequently flooded and raised islands that are rarely flooded. Elevations range from 980 to 2,900 feet. Slopes typically range from 2 to 8 percent. The soils are very deep, gravelly or very gravelly sands. Surface cobbles are typical, and patches of cobbles are interspersed with patches of bare sand. The site is dominated by burrobrush (*Hymenoclea salsola*), desert lavender (*Hyptis emoryi*), and brittlebrush (*Encelia farinosa*). Smoketree (*Psoralea argemone*) is present in active channels. Blue paloverde (*Parkinsonia florida*) and desert ironwood (*Olneya tesota*) are scattered throughout the site.

**R031XY202CA Stony, Occasionally Flooded Ephemeral Stream; *Parkinsonia florida*/Hyptis emoryi-Psoralea argemone.** This ecological site occurs on stony inset fans among cobbly fan remnants (fig. 72). The site primarily receives runoff from



adjacent fan remnants but may also receive divergent flow from larger drainages above. Soil surfaces are cobbly to stony. Elevations range from 1,130 to 2,890 feet. Slopes range from 4 to 15 percent. Blue paloverde (*Parkinsonia florida*) is dominant. Desert lavender (*Hyptis emoryi*) and Schott's dalea (*Psoralea schottii*) are other important species. The additional run-on provided by the rocky surfaces of both the inset fans and the fan remnants supports a high amount of blue paloverde and favors habitat for desert lavender and Schott's dalea.

# Use and Management of the Soils

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This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

## Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

### Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited*, *somewhat limited*, and *very limited*. The suitability ratings are expressed as *well suited*, *moderately suited*, *poorly suited*, and *unsuited* or as *good*, *fair*, and *poor*.

### Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate

gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

## Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA-SCS, 1961).

*Capability classes*, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

*Capability subclasses* are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2*e*. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

*Capability units* are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require

similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

The acreage of soils in each capability class or subclass is shown in table 2. The capability classification of map units in this survey area is given in the section “Detailed Soil Map Units” and in table 10.

## Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

There are no areas in Joshua Tree National Park that meet the soil requirements for prime farmland.

## Hydric Soils

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands. Onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; USDA-NRCS, 2010).

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties

unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2010) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (USDA-NRCS, 2010).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes (for example, 2B3). Definitions for the codes are as follows:

1. All Histels except for Folistels and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
  - A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
  - B. are poorly drained or very poorly drained and have either:
    - 1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
    - 2) a water table at a depth of 0.5 foot or less during the growing season if saturated hydraulic conductivity ( $K_{sat}$ ) is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
    - 3) a water table at a depth of 1.0 foot or less during the growing season if saturated hydraulic conductivity ( $K_{sat}$ ) is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for periods of long or very long duration during the growing season.
4. Soils that are frequently flooded for periods of long or very long duration during the growing season.

There are no areas of hydric soils mapped in Joshua Tree National Park.

## Land Management

In table 11, parts I through IV, interpretive ratings are given for various aspects of land management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified land management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates



that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified land management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for *fire damage* and *seedling mortality* are expressed as low, moderate, and high. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

Rating class terms for *hazard of erosion* are expressed as slight, moderate, severe, and very severe. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for erosion is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for land management practices.

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of planting equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Ratings in the column *hazard of erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in areas where 50 to 75 percent of the surface has been exposed by different kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

## Recreation

The soils of the park are rated in table 12, parts I and II, according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the table are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in table 12 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, and water management.

*Camp areas* require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

*Picnic areas* are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

*Foot traffic and equestrian trails* for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

*Mountain bike and off-road vehicle trails* require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, depth to a water table, ponding, slope, flooding, and texture of the surface layer.

## Desert Tortoise

The desert tortoise (*Gopherus agassizii*) was federally listed as a “threatened” species in April 1990 under provisions of the Endangered Species Act of 1973. The burrowing habitat of the desert tortoise is of special interest in the survey area. At least 95 percent of the desert tortoise’s life is spent in burrows (Burge and Royo, 2000).

The presence of soil suitable for digging burrows is a factor limiting the distribution of the desert tortoise habitat. Some of its burrows are just deep enough for the tortoise to fit into, while others extend for several feet (Burge and Royo, 2000).

In the survey area, soils on mountains and hills are typically poorly suited to tortoise burrowing. A shallow depth to bedrock and excessive rock fragments make burrowing difficult. Soils on bolson floors are typically poorly suited because of potential flooding or ponding, fine textured soil material, and/or gypsic layers. The suitability of soils on fan piedmonts ranges from excellent to poor for tortoise burrowing habitat.

For simplicity, fan piedmont soils can be broken down into recent alluvial fans and fan remnants. Soils on recent alluvial fans have undergone little soil development. The moderately coarse textured and medium textured soils are typically suitable for

burrowing. Soil properties that reduce suitability for burrowing habitat are flooding, excess sand or clay, large or small rock fragments, and dense layers.

Soils on fan remnants have developed duripans from an increase in lime deposition. In addition to the soil properties mentioned above, a duripan at a shallow depth can reduce suitability for burrowing habitat. Areas with drainageways incised below the duripan, however, often can be used for burrowing. Field examination of these drainageways and other areas with different micro-environmental soil characteristics is recommended.

Table 13 shows the degree and kind of soil limitations that affect desert tortoise for burrowing. The soil is interpreted as a habitat component according to its potential to be used by desert tortoises in excavating burrows. Burrows are considered a necessary part of specific local habitat. The interpretations in the table evaluate the following soil properties at variable depths in the soil: flooding, ponding, wetness, slope, content of clay and sand, organic matter content, fragments 0.2 inch to 3 inches and more than 3 inches in diameter, depth to bedrock, depth to cemented pan, bulk density, and gypsum content.

The information in table 13 is intended to assist in the identification and selection of sites that have the most potential for preserving, maintaining, or increasing local populations of desert tortoise. This table evaluates only one habitat criteria. Other habitat needs include the ability of a site to provide food, cover, and water. NRCS ecological site descriptions provide important information on the kinds and amounts of vegetation that can be expected on different soils.

The interpretations in the table can be used in the planning process to identify areas of concern prior to the application of conservation practices. Based upon the wildlife objectives, these areas can be avoided or practices can be adjusted to minimize damage to the burrow habitat. The ratings in table 13 do not take into account climate or soil temperature which may influence the presence or distribution patterns of a species. The presence or absence of a species is determined at the local level.

The interpretations provide suitability ratings and identify the dominant soil characteristics that influence the suitability of the site for burrowing by desert tortoise. This information allows the user to plan and develop alternatives in site selection by identifying the site that best meets the wildlife habitat requirements. For a complete evaluation of habitat requirements, the ecological site descriptions should be consulted.

Soils that are rated *well suited* have no use restrictions and are favorable for burrowing by desert tortoise. Colonization and population densities may be above average if other habitat factors are not limiting. A rating of *suitably* implies that the site is suitable as habitat for burrowing by desert tortoise and that some restrictive features may limit the use of the site. Colonization and population densities may be average for the area if the other habitat requirements are met. A rating of *poorly suited* indicates that soil characteristics may limit establishment, maintenance, or use of the site for burrowing species. Colonization and population densities may be restricted in the area due to the limiting factors even though all of the other species habitat requirements are met.

The final identification and selection of a site suitable for burrowing by desert tortoise is determined by the limitation of the soil as it influences excavation, maintenance, and preservation of the burrows. Table 13 identifies the soil-restricting features that will have the most effect on habitat.

The assumptions made about the rating criteria listed in the table are as follows:

1. Flooding from stream overflow adversely affects burrowing suitability. In areas subject to flooding, the burrowing reptiles are evicted, species are drowned, and the walls of the burrows may collapse or become filled with debris. Any effort of the animals to return to the site is delayed until the floodwater has receded and the soils have dried sufficiently to allow renewed activity.

2. Ponding or standing water adversely affects burrowing species.
3. Bedrock adversely affects the potential depth of excavation by burrowing species. The layers are either too hard or too dense for the species to excavate.
4. Highly gypsiferous layers may adversely affect the potential depth of excavation by burrowing species. The layers may be too dense for the species to excavate or may be undesirable due to the high amounts of gypsum crystals.
5. Cemented layers adversely affect the potential depth of excavation by burrowing species. The layers are either too hard or too dense for the species to excavate.
6. A seasonal high water table can affect burrowing species, restrict burrowing, and possibly cause drowning when the water table returns. Caving or tunnel collapse may be a problem, especially in those parts of the soil affected by the capillary fringe.
- 7a. Sandy layers are soft and loose. Burrow excavation and maintenance are problems due to reduced sidewall stability and the tendency for collapse.
- 7b. Clayey layers are slippery and sticky when wet, are slow to dry, and, when dry, are usually hard. They affect the ability of the burrowing species to excavate.
- 7c. A high content of organic matter affects maintenance of the burrows due to reduced sidewall stability and the tendency to collapse. Highly fibrous organic materials are difficult to burrow.
- 8a and 8b. High concentrations of rock fragments adversely affect the excavation of soil by burrowing species. The physical effort to dislodge or transport the rock fragments from the burrow may be beyond the abilities of many species.
9. Dense layers adversely affect the potential depth of excavation by burrowing species. The layers are either too hard or too dense for the species to excavate.

## Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, and construction materials. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

*Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.*

*The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.*

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential,



available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

## Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 14 shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Dwellings* are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

*Small commercial buildings* are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of

reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

## **Roads and Streets, Shallow Excavations, and Landscaping**

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 15 shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Local roads and streets* have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

*Shallow excavations* are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

*Landscaping* requires soils on which turf, trees, and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil

properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

## Sanitary Facilities

Table 16, parts I and II show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Septic tank absorption fields* are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

*Sewage lagoons* are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if

fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

*Daily cover for landfill* is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

## Construction Materials

Table 17, parts I and II give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated *good*, *fair*, or *poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

The soils are rated as a *probable* or *improbable* source of sand and gravel. A rating of *probable* means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of sand or gravel.

*Gravel* and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 17, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

*Reclamation material* is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

*Roadfill* is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of



excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

*Topsoil* is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.



# Soil Properties

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Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering properties, physical and chemical properties, and pertinent soil and water features.

## Engineering Properties

Table 18 gives the engineering classifications and the range of engineering properties for the layers of each soil in the park.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

*Classification* of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement,

the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

*Rock fragments* larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit* and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

## Physical Soil Properties

Table 19 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the park. The estimates are based on field observations and on test data for these and similar soils.

*Depth* to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

*Sand* as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

*Silt* as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

*Clay* as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity ( $K_{sat}$ ), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

*Moist bulk density* is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at  $1/3$ - or  $1/10$ -bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil

properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

*Permeability* ( $K_{sat}$ ) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity ( $K_{sat}$ ). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

*Available water capacity* refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

*Shrink-swell potential* is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, greater than 9 percent.

*Organic matter* is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

## Erosion Properties

Table 20 shows estimates of some erosion factors that affect a soil's potential for different uses. These estimates are given for each layer of every soil for K factors and are given as one rating for the entire soil for the T factor, the wind erodibility group, and the wind erodibility index. Values are reported for each soil in the park. Estimates are based on field observations and on test data for these and similar soils.

Erosion factors are shown in the table as the K factor ( $K_w$  and  $K_f$ ) and the T factor. Soil erosion factors ( $K_w$ ) and ( $K_f$ ) quantify soil detachment by runoff and raindrop impact. These erosion factors are indexes used to predict the long-term average soil loss from sheet and rill erosion under crop systems and conservation techniques. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of



soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and  $K_{sat}$ . Values of  $K$  range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

The procedure for determining the  $K_f$  factor is outlined in Agriculture Handbook 703, "Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)," USDA, Agricultural Research Service, 1997.

*Erosion factor  $K_w$*  indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments. In horizons where total rock fragments are 15 percent or more, by volume, the  $K_w$  factor is always less than the  $K_f$  factor.

*Erosion factor  $K_f$*  indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size. Soil horizons that do not have rock fragments are assigned equal  $K_w$  and  $K_f$  factors.

*Erosion factor  $T$*  is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

*Wind erodibility groups* are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

*Wind erodibility index* is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

## Total Soil Carbon

Table 21 gives estimates of total soil carbon. Soil carbon occurs as organic and inorganic carbon.

Soil organic carbon (SOC) is carbon (C) in soil that originated from a biological source, such as plants, animals, or micro-organisms. SOC is found in both organic and mineral soil layers. The term "soil organic carbon" refers only to the carbon occurring in soil organic matter (SOM). Soil organic carbon makes up about one-half the weight of soil organic matter. The rest of SOM is mostly oxygen, nitrogen, and hydrogen.

Soil inorganic carbon (SIC) is carbon found in soil carbonates, typically as calcium carbonate layers in the soil or as clay-sized fractions throughout the soil. Carbonates in soils are most common in areas where evaporation rates exceed precipitation, as is the case in most desert environments. Typically, the carbonates accumulated from carbonatic dust or from solution during periods of wetter climates. Soil inorganic carbon also occurs in soils that formed in marl in all regions of the country.

The SOC and SIC contents are reported in kilograms per square meter to a depth of 2 meters or to a representative depth of either hard bedrock or a cemented horizon. The SOC and SIC values are on a whole soil basis, corrected for rock fragments.

SOC can be an indicator of overall soil fertility and soil quality that affects ecosystem function. SOM is the main reservoir for most plant nutrients, such as phosphorus and nitrogen. Managing for SOC by managing for SOM increases the content of these elements and improves soil resiliency.

Soil organic matter binds soil particles together and thus increases soil porosity and water infiltration and allows better root penetration and waterflow into the soil. Greater inflow of water reduces the hazard of erosion and the rate of surface water runoff.

Greater SOC levels improve not only soil quality but also the quality of air and water. Soil acts as a filter and improves water quality. Fertile soils that support plant life remove  $CO_2$  from the atmosphere and increase oxygen levels through photosynthesis.

Maintaining the level of soil organic carbon reduces C release into the atmosphere and thus can lessen the effects of global warming.

SIC influences the types of plants that will grow. High SIC levels are commonly associated with a higher soil pH, which limits the types of plants that will thrive.

Like SOM, soil carbonates, the source of SIC, also bind soil particles together. They fill voids in the soil and thus can reduce soil porosity. Compacted soil carbonates may restrict root penetration and waterflow into the soil.

## Chemical Soil Properties

Table 22 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the park. The estimates are based on field observations and on test data for these and similar soils.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Cation-exchange capacity* is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

*Soil reaction* is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

*Calcium carbonate* equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

*Salinity* is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

*Sodium adsorption ratio* (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced saturated hydraulic conductivity ( $K_{sat}$ ) and aeration, and a general degradation of soil structure.

## Soil Features

Table 23 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the thickness of the restrictive layer, which significantly affects the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

*Potential for frost action* is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity ( $K_{sat}$ ), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

*Risk of corrosion* pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

## Water Features

Table 24 gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

*Hydrologic soil groups* are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

*Water table* refers to a saturated zone in the soil. Table 24 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

*Ponding* is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

*Flooding* is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

*Duration* and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.





# Classification of the Soils

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The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2010). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The categories are defined in the following paragraphs.

**ORDER.** Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Aridisol.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. Sixty-four suborders are recognized at the next level of classification. The last syllable in the name of a suborder indicates the order. An example is Argid (*Arg*, meaning clay accumulation, plus *id*, from Aridisol).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. There are about 300 great groups. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplargids (*Hapl*, meaning minimal horizonation, plus *Argid*, the suborder of the Aridisols that has clay accumulation as its main form of pedogenesis).

**SUBGROUP.** There are more than 2,400 subgroups. Each great group has a typic subgroup. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Other subgroups are intergrades or extragrades. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplargids.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties for family placement are those of horizons below a traditional agronomic plow depth. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, superactive, thermic Typic Haplargids.

**SERIES.** The soil series is the lowest category in the soil classification system. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Most parks are mapped to the series level. The names of soil series are selected by the soil scientists during the course of mapping. The series names are commonly geographic place names or are coined. Because of access limitations and soil variability, soils in some remote areas are classified at the great group or subgroup level.

Table 25 indicates the order, suborder, great group, subgroup, and family of the soil series in the park. Table 26 displays the classification as a key sorted by soil order.

## Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, which is typical of the series in the survey area, is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 2010). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series. The map units of each soil series are described in the section "Detailed Soil Map Units."

## Aguilareal Series

The Aguilareal series consists of shallow, somewhat excessively drained soils that formed in residuum and colluvium from granitoid rock. Aguilareal soils are on mountains. Slopes range from 8 to 60 percent. The mean annual precipitation is about 137 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (64.5 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids

### Typical Pedon

Aguilareal gravelly loamy sand; Riverside County, California; on a southwest-facing, convex, 55 percent slope under sparse desert shrubs, approximately 0.7 kilometer southeast of Big Wash on Pintobasin Road in Joshua Tree National Park; 85 meters (278 feet) north and 1,055 meters (2,256 feet) east of the southwest corner of section 25, T. 4 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 985 meters (3,230 feet); lat. 33 degrees 47 minutes 17.8 seconds N. and long. 115 degrees 47 minutes 05.9 seconds W.; USGS Porcupine Wash 7.5 minute topographic quadrangle; UTM 11S 0612486e 3739344n (DTM: NAD83). (When described, the soil was dry throughout.)

- C—0 to 8 centimeters (0 to 3 inches); stones; 15 percent fine gravel, 30 percent medium and coarse gravel, 15 percent cobbles, 15 percent stones, and 10 percent boulders; abrupt wavy boundary. (0 to 8 centimeters thick)
- A—8 to 12 centimeters (3 to 5 inches); brown (10YR 4/3) gravelly loamy sand, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine and very few fine roots throughout; few very fine and fine irregular and few medium tubular pores throughout; 15 percent fine gravel, 10 percent medium and coarse gravel, and 1 percent cobbles; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary. (1 to 8 centimeters thick)
- Bk1—12 to 35 centimeters (5 to 14 inches); brown (10YR 5/3) very gravelly sandy loam, olive brown (2.5Y 4/3) moist; moderate fine and medium subangular blocky

structure; slightly hard, very friable; nonsticky and nonplastic; 4 percent faint white (10YR 8/1) carbonate coats on bottoms of rock fragments; few very fine, fine, and medium roots throughout; few fine and medium irregular pores throughout; 25 percent fine gravel, 10 percent medium and coarse gravel, 5 percent cobbles, and 2 percent stones; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk2—35 to 48 centimeters (14 to 19 inches); pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable; slightly sticky and slightly plastic; 20 percent faint white (10YR 8/1) carbonate coats on bottoms and sides of rock fragments; few very fine and fine and very few medium roots throughout; few fine irregular and few fine and medium tubular pores throughout; 20 percent fine gravel, 10 percent medium and coarse gravel, and 10 percent cobbles; violently effervescent; moderately alkaline (pH 8.1); abrupt wavy boundary. (Combined thickness of the Bk horizons is 28 to 45 centimeters)

Rk—48 to 73 centimeters (19 to 29 inches); unweathered, fractured granitoid bedrock; 30 percent very coarse white (10YR 8/1) moderately cemented, sharp, platy and irregular calcium carbonate masses on top of bedrock and filling fractures 0 to 9 centimeters wide; common very fine and few fine roots in mats on top of bedrock; fractures are more than 10 centimeters apart; high or extremely high excavation difficulty.

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 18.5 to 22 degrees C (65 to 72 degrees F)

*Surface rock fragments:* 60 to 85 percent; including 30 to 55 percent gravel, 15 to 35 percent cobbles, 4 to 25 percent stones, and 1 to 15 boulders

*Depth to a lithic contact:* 36 to 50 centimeters

*Organic matter content:* 0 to 0.5 percent

#### *Control section:*

Rock fragments—50 to 75 percent; gravel, cobbles, stones, and boulders  
Clay content—10 to 18 percent

#### *C horizon:*

Rock fragments—80 to 85 percent; including 30 to 55 percent gravel, 15 to 30 percent cobbles, 5 to 25 percent stones, and 1 to 10 percent boulders

#### *A horizon:*

Hue—10YR or 2.5Y

Value—4 to 6 dry; 3 or 4 moist

Chroma—2 or 3 moist

Clay content—4 to 8 percent

Rock fragments—25 to 65 percent; including 25 to 45 percent gravel, 1 to 30 percent cobbles, and 0 to 15 percent stones

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral to moderately alkaline

#### *Bw or Bk horizon:*

Hue—10YR or 2.5Y

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sandy loam or fine sandy loam

Clay content—8 to 18 percent

Rock fragments—35 to 75 percent; including 25 to 60 percent gravel, 0 to 25 percent cobbles, and 0 to 15 percent stones

Effervescence—noneffervescent to violently effervescent

Reaction—neutral to moderately alkaline

Visible secondary carbonates—0 to 3 percent as coats on bottom of rock fragments

*Rk horizon:*

Bedrock—unweathered, slightly to moderately fractured granitoid with moderate to extremely high excavation difficulty

## Ambrosia Series

The Ambrosia series consists of very deep, somewhat excessively drained soils that formed in granitic alluvium. Ambrosia soils are on fan aprons and fan remnants. Slopes range from 0 to 4 percent. The mean annual precipitation is about 125 millimeters (5 inches), and the mean annual air temperature is about 18.5 degrees C (66 degrees F).

### Taxonomic Classification

Sandy, mixed, thermic Typic Haplocalcids

### Typical Pedon

Garlock-Arizo-Ambrosia complex, 2 to 8 percent slopes; San Bernardino County, California, about 135 kilometers north of the survey area within Fort Irwin Military Reservation; about 1,950 feet west and 600 feet south of the northeast corner of section 29, T. 13 N., R. 12 E.; at an elevation of 2,950 feet; lat. 35 degrees 12 minutes 14 seconds N. and long. 116 degrees 47 minutes 19 seconds W.; USGS Paradise Range 7.5 minute topographic quadrangle; UTM 11S 0519114e 3894654n. The surface is covered by 50 percent gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 5 centimeters (0 to 2 inches); dark yellowish brown (10YR 4/4) very gravelly sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; common very fine and fine roots throughout; common very fine tubular and many very fine interstitial pores; 40 percent gravel; slightly alkaline (pH 7.8); clear smooth boundary.

AB—5 to 10 centimeters (2 to 4 inches); dark yellowish brown (10YR 4/4) gravelly loamy sand, brown (10YR 4/3) moist; moderate medium subangular blocky structure; loose, loose; nonsticky and nonplastic; common very fine roots throughout and few medium and coarse roots in cracks; common very fine and fine tubular and many very fine interstitial pores; 25 percent gravel; slightly alkaline (pH 7.7); clear wavy boundary.

Btk—10 to 78 centimeters (4 to 31 inches); brown (10YR 5/3) gravelly loamy sand, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; loose; nonsticky and nonplastic; common very fine and few medium roots throughout; few fine and many very fine interstitial pores; very few thin clay films on faces of peds; slightly effervescent with disseminated lime throughout (calcium carbonate equivalent of 5 percent); 26 percent gravel; moderately alkaline (pH 8.1); clear wavy boundary.

Bk—78 to 98 centimeters (31 to 39 inches); dark yellowish brown (10YR 4/6) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine and fine roots throughout; many very fine interstitial pores; slightly effervescent with calcium carbonate disseminated and segregated with thin strata 2 to 3 inches

wide (calcium carbonate equivalent of 6 percent); 30 percent gravel; moderately alkaline (pH 8.4); abrupt smooth boundary.

Ck—98 to 133 centimeters (39 to 53 inches); brown (10YR 5/3) gravelly sand, yellowish brown (10YR 5/4) moist; massive; loose; nonsticky and nonplastic; few very fine and fine roots throughout; many very fine interstitial pores; slightly effervescent with disseminated calcium carbonate (calcium carbonate equivalent of 6 percent); 30 percent gravel; moderately alkaline (pH 7.9); clear irregular boundary.

C1—133 to 165 centimeters (53 to 66 inches); dark yellowish brown (10YR 4/6) gravelly sand, yellowish brown (10YR 5/4) moist; single grain; loose; nonsticky and nonplastic; few very fine and fine roots throughout; many very fine interstitial pores; noneffervescent; 20 percent gravel; moderately alkaline (pH 8.0); clear irregular boundary.

C2—165 to 200 centimeters (66 to 80 inches); yellowish brown (10YR 5/6) very gravelly sand, yellowish brown (10YR 5/4) moist; massive; loose; nonsticky and nonplastic; few very fine and fine roots throughout; many very fine interstitial pores; 40 percent gravel; moderately alkaline (pH 8.3).

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 63 to 72 degrees F

*Surface rock fragments:* 15 to 80 percent gravel and 0 to 5 percent stones

#### *Control section:*

Depth to a calcic horizon—5 to 40 centimeters (2 to 16 inches)

Organic matter content—0 to 0.5 percent

#### *A horizon:*

Value—4 or 5 dry; 3 or 4 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—coarse sand, loamy sand, or sandy loam

Clay content—5 to 15 percent

Rock fragments—15 to 55 percent gravel

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline or moderately alkaline

#### *Bk or Btk horizon(s):*

Value—4 to 8 dry; 4 to 7 moist

Chroma—3 to 6, dry or moist

Clay content—5 to 10 percent

Rock fragments—20 to 30 percent gravel

Calcium carbonate equivalent—5 to 10 percent

Reaction—slightly alkaline or moderately alkaline

#### *C horizon:*

Value—4 to 8 dry; 4 to 6 moist

Chroma—3 to 6 dry; 3 or 4 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—2 to 10 percent

Rock fragments—20 to 45 percent gravel

Calcium carbonate equivalent—5 to 10 percent in upper part of horizon and 0 to 5 percent in the lower part

Reaction—slightly alkaline or moderately alkaline



## Aquapeak Series

The Aquapeak series consists of very shallow and shallow, well drained soils that formed in alluvium from granitoid or other igneous rocks. Aquapeak soils are on fan remnants. Slopes range from 0 to 15 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (70 degrees F).

### Taxonomic Classification

Loamy, mixed, superactive, hyperthermic, shallow Argidic Argidurids

### Typical Pedon

Aquapeak very gravelly fine sandy loam; San Bernardino County, California; on a northeast-facing, convex, 6 percent slope under sparse desert shrubs, approximately 3.1 kilometers south-southeast of the junction of Highway 62 and Iron Age Road; 35 meters (115 feet) west and 600 meters (1,968 feet) north of the southeast corner of section 13, T. 1 S., R. 12 E., San Bernardino Base and Meridian; at an elevation of 484 meters (1,589 feet); lat. 34 degrees 05 minutes 02.5 seconds N. and long. 115 degrees 40 minutes 04.4 seconds W.; USGS New Dale 7.5 minute topographic quadrangle; UTM 11S 0622902e 3772274n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 5 centimeters (0 to 2 inches); gravel; approximately 15 percent fine gravel, 65 percent medium and coarse gravel, 10 percent cobbles, and 2 percent stones; abrupt smooth boundary. (0 to 7 centimeters thick)

A—5 to 8 centimeters (2 to 3 inches); pink (7.5YR 7/4) and light yellowish brown (10YR 6/4) gravelly fine sandy loam, strong brown (7.5YR 4/6) moist; moderate thick platy structure parting to weak medium subangular blocky; slightly hard, friable; slightly sticky and moderately plastic; common very fine and fine and few medium vesicular pores; 10 percent fine gravel and 15 percent medium and coarse gravel; violently effervescent; very strongly alkaline (pH 9.1); abrupt wavy boundary. (1 to 10 centimeters thick)

Btkq—8 to 27 centimeters (3 to 11 inches); strong brown (7.5YR 5/6) fine sandy loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; moderately hard, firm; slightly sticky and moderately plastic; 35 percent faint strong brown (7.5YR 4/6) clay films on faces of peds; 1 percent fine distinct white (10YR 8/1) cylindrical calcium carbonate masses in the matrix; 10 percent faint pink (7.5YR 7/3) silica coats on bottom of rock fragments; few very fine roots; common very fine and few medium interstitial pores; 5 percent fine gravel and 5 percent medium and coarse gravel; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (11 to 30 centimeters thick)

Bkqm—27 to 48 centimeters (11 to 19 inches); pale yellow (2.5Y 8/2) weakly cemented gravelly loamy sand, pale yellow (2.5Y 7/3) moist; duripan with continuous cementation; massive; very hard, very firm; brittle; 10 percent fine gravel and 10 percent medium and coarse gravel; gradual wavy boundary. (20 to 60 centimeters thick)

Bkq1—48 to 84 centimeters (19 to 33 inches); pale yellow (2.5Y 8/2) gravelly loamy sand, very pale brown (10YR 7/4) moist; massive; moderately hard, firm; nonsticky and nonplastic; 40 percent prominent very pale brown (10YR 8/2) calcium carbonate coats on all sides of rock fragments; 30 percent faint very pale brown (10YR 7/3) silica coats on bottom of rock fragments; 10 percent fine gravel and 10 percent medium and coarse gravel; violently effervescent (17 percent calcium carbonate equivalent in the fine-earth fraction); slightly alkaline (pH 7.7); gradual wavy boundary.

Bkq2—84 to 152 centimeters (33 to 60 inches); very pale brown (10YR 8/2) gravelly sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard, friable; nonsticky and nonplastic; 50 percent prominent very pale brown (10YR 8/2) calcium carbonate coats on bottom of rock fragments; 30 percent faint very pale brown (10YR 7/3) silica coats on bottom of rock fragments; 15 percent fine gravel and 15 percent medium and coarse gravel; violently effervescent (10 percent calcium carbonate equivalent in the fine-earth fraction); slightly alkaline (pH 7.8). (20 to 125 centimeters thick)

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 35 to 98 percent; including 10 to 40 percent fine gravel, 20 to 85 percent medium and coarse gravel, 3 to 30 percent cobbles, 0 to 5 percent stones, and 0 to 2 percent boulders

#### *Control section:*

Depth to the upper boundary of an argillic horizon from the upper boundary of the A horizon—1 to 10 centimeters (0.5 inch to 4 inches)

Depth to the upper boundary of a duripan from the upper boundary of the A horizon—12 to 36 centimeters (5 to 14 inches)

Clay content—average of 8 to 18 percent

Rock fragments—1 to 30 percent; including 1 to 30 percent gravel and 0 to 5 percent cobbles

Organic matter content—0 to 0.5 percent

#### *C horizon (if it occurs):*

Rock fragments—80 to 98 percent; including 1 to 20 percent fine gravel, 35 to 85 percent medium to coarse gravel, 3 to 30 percent cobbles, and 0 to 5 percent stones

#### *A horizon:*

Hue—7.5YR or 10YR

Value—5 to 7 dry; 4 or 5 moist

Chroma—3 or 4 dry; 2 to 6 moist

Clay content—3 to 15 percent

Texture of the fine-earth fraction—fine sand, fine sandy loam, or loam

Rock fragments—15 to 55 percent gravel

Effervescence—noneffervescent to violently effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline to very strongly alkaline

Salinity—0 to 4 dS/m

Other features—significant quantity of vesicular pores throughout horizon

#### *Btk or Btkq horizon:*

Hue—7.5YR or 10YR

Value—5 or 6 dry; 4 or 5 moist

Chroma—4 to 6, dry or moist

Clay content—8 to 20 percent

Texture of the fine-earth fraction—sandy loam, fine sandy loam, or loam

Rock fragments—5 to 35 percent; including 3 to 30 percent gravel and 0 to 5 percent cobbles

Effervescence—noneffervescent to violently effervescent

Calcium carbonate equivalent—0 to 10 percent  
Reaction—slightly alkaline to strongly alkaline  
Salinity—0 to 4 dS/m  
Silica—0 to 10 percent as coats on underside of rock fragments

*Bkq or Bkqm horizon:*

Hue—7.5YR, 10YR, or 2.5Y  
Value—5 to 8 dry; 4 to 7 moist  
Chroma—1 to 6 dry; 2 to 6 moist  
Clay content—3 to 12 percent  
Texture of the fine-earth fraction—sand, loamy sand, or sandy loam  
Rock fragments—5 to 60 percent; including 5 to 45 percent gravel, 0 to 10 percent cobbles, and 0 to 10 percent stones  
Effervescence—slightly to violently effervescent  
Calcium carbonate equivalent—1 to 20 percent  
Reaction—slightly alkaline to strongly alkaline  
Salinity—0 to 4 dS/m  
Silica—0 to 40 percent as coats on underside of rock fragments  
Cementation—75 to 100 percent; weak to moderate

*Ck or C horizon (if it occurs):*

Value—5 to 7 dry; 4 or 5 moist  
Chroma—2 to 4 dry; 3 to 6 moist  
Clay content—1 to 6 percent  
Texture of the fine-earth fraction—sand or loamy sand  
Rock fragments—5 to 45 percent; including 5 to 35 percent gravel and 0 to 10 percent cobbles  
Effervescence—slightly to violently effervescent  
Calcium carbonate equivalent—1 to 5 percent  
Reaction—slightly alkaline to strongly alkaline  
Salinity—0 to 6 dS/m

## Arizo Series

The Arizo series consists of very deep, excessively drained soils that formed in alluvium derived from granitoid and/or gneiss. Arizo soils are on alluvial fans, on inset fans, and in drainageways. Slopes range from 1 to 15 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Sandy-skeletal, mixed, thermic Typic Torriorthents

### Typical Pedon

Arizo gravelly sand; Riverside County, California; on a south-southwest-facing (214 degrees), 4 percent slope, approximately 450 meters north of Pinkham Canyon Road in Joshua Tree National Park; approximately 810 meters north and 395 meters east of the southwest corner of section 33, T. 4 S., R. 10 E., San Bernardino Base and Meridian; at an elevation of 940 meters (about 3,080 feet); lat. 33 degrees 46 minutes 49.0 seconds N. and long. 115 degrees 57 minutes 02.9 seconds W.; USGS Washington Wash, California 7.5 minute topographic quadrangle; UTM 11S 597143e 3738289n (DTM: NAD83). The surface is covered by 12 percent fine gravel, 20 percent medium and coarse gravel, 15 percent cobbles, and 2 percent stones. (When described on September 15, 2010, the soil was dry throughout.)

- C1—0 to 16 centimeters (0 to 6 inches); brown (10YR 4/3) gravelly sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; nonsticky and nonplastic; 10 percent fine gravel, 15 percent medium and coarse gravel, and 3 percent cobbles; slightly alkaline (pH 7.6); clear smooth boundary.
- C2—16 to 23 centimeters (6 to 9 inches); yellowish brown (10YR 5/4) loamy very fine sand, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, very friable; nonsticky and nonplastic; few fine and common very fine roots; common very fine irregular pores; 2 percent fine gravel and 3 percent medium and coarse gravel; very slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.
- C3—23 to 52 centimeters (9 to 20 inches); brown (10YR 4/3) stratified very gravelly coarse sand, dark brown (10YR 3/3) moist; single grain; loose; nonsticky and nonplastic; few very fine roots; 20 percent fine gravel, 25 percent medium and coarse gravel, 3 percent cobbles, and 3 percent stones; slightly alkaline (pH 7.6); gradual wavy boundary.
- C4—52 to 100 centimeters (20 to 39 inches); brown (10YR 5/3) extremely gravelly coarse sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; nonsticky and nonplastic; few fine roots; 21 percent fine gravel, 42 percent medium and coarse gravel, and 25 percent cobbles; slightly alkaline (pH 7.5).

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days cumulative following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 15 to 22 degrees C (59 to 72 degrees F)

#### *Control section:*

Rock fragments—35 to 85 percent; mainly medium and coarse gravel and/or cobbles and stones

Clay content—1 to 6 percent

#### *A horizon (if it occurs):*

Value—5 to 8 dry; 3 to 6 moist

Chroma—2 to 6

Texture of the fine-earth fraction—sand, fine sand, loamy sand, or sandy loam

Rock fragments—5 to 60 percent

#### *Bw and/or C horizons:*

Value—4 to 8 dry; 3 to 6 moist

Chroma—2 to 6

Texture of the fine-earth fraction—coarse sand, sand, loamy sand, or loamy fine sand

Rock fragments—35 to 85 percent

## Bigbernie Series

The Bigbernie series consists of moderately deep, somewhat excessively drained soils that formed in colluvium over residuum weathered from granitoid and gneiss. Bigbernie soils are on mountain slopes. Slopes range from 30 to 75 percent. The mean annual precipitation is 150 millimeters, and the mean annual air temperature is 18.5 degrees C

#### Taxonomic Classification

Sandy-skeletal, mixed, thermic Typic Torriorthents

### Typical Pedon

Bigbernie gravelly loamy sand; San Bernardino County, California; on a southwest-facing, 56 percent slope, approximately 3.5 miles south of the town of Yucca Valley; approximately 1,025 meters east and 710 meters north of the southwest corner of section 23, T. 1 S., R. 5 E., San Bernardino Base and Meridian; at an elevation of 1,363 meters; lat. 34 degrees 04 minutes 05 seconds N. and long. 116 degrees 25 minutes 45 seconds W.; USGS Yucca Valley South, California 7.5 minute topographic quadrangle; UTM 11S 552684e 3769850n (DTM: NAD83). The surface is covered by approximately 33 percent fine gravel, 15 percent medium and coarse gravel, 10 percent cobbles, 1 percent stones, and 1 percent boulders. (Colors are for dry soil unless otherwise stated.)

- A—0 to 2 centimeters (0 to 1 inch); brown (10YR 4/3) gravelly loamy sand, very dark grayish brown (10YR 3/2) moist; strong very thick platy structure; slightly hard, very friable; nonsticky and nonplastic; common very fine roots; common fine irregular pores; 15 percent fine gravel, 10 percent medium and coarse gravel, and 5 percent cobbles; slightly alkaline (pH 7.6); clear smooth boundary. (2 to 11 centimeters thick)
- Bw—2 to 11 centimeters (1 to 4 inches); dark yellowish brown (10YR 4/4) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; many very fine and common fine roots; few fine tubular pores; 10 percent fine gravel, 15 percent medium and coarse gravel, and 15 percent cobbles; slightly alkaline (pH 7.4); clear smooth boundary. (9 to 54 centimeters thick)
- BC—11 to 60 centimeters (4 to 24 inches); brown (10YR 4/3) very gravelly sand, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to massive; slightly hard, very friable; nonsticky and nonplastic; common very fine and fine and moderately few medium roots; few very fine interstitial pores; 25 percent fine gravel, 5 percent medium and coarse gravel, 3 percent cobbles, 10 percent stones, and 15 percent parastones; slightly alkaline (pH 7.4); clear wavy boundary. (0 to 60 centimeters thick)
- Cr—60 to 150 centimeters (24 to 60 inches); moderately cemented granitoid bedrock with cracks more than 10 centimeters apart; common very fine and fine roots matted at top of horizon.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; these soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Depth to paralithic contact:* 50 to 100 centimeters (20 to 40 inches)

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 35 to 80 percent; dominantly gravel

#### *Control section:*

Rock fragments—35 to 75 percent

Clay content—2 to 5 percent

Effervescence—noneffervescent throughout

#### *A horizon:*

Hue—10YR or 2.5Y

Value—4 to 6 dry; 2 to 4 moist

Chroma—3 or 4 dry; 2 to 4 moist



Texture of the fine-earth fraction—coarse sand, fine sand, loamy sand, or loamy fine sand

Clay content—2 to 5 percent

Rock fragments—25 to 40 percent; dominantly gravel

Reaction—neutral to moderately alkaline

*Bw or BA horizon:*

Value—4 to 6 dry; 3 or 4 moist

Chroma—2 to 4 moist

Texture of the fine-earth fraction—sand, fine sand, loamy coarse sand, or loamy sand

Clay content—2 to 5 percent

Rock fragments—35 to 60 percent; dominantly gravel

Reaction—slightly alkaline or moderately alkaline

*BC or C horizon (if it occurs):*

Value—4 to 6 dry; 1 to 4 moist

Chroma—3 or 4 dry; 1 to 4 moist

Texture of the fine-earth fraction—coarse sand or sand

Clay content—1 to 4 percent

Rock fragments—35 to 75 percent; dominantly gravel

Reaction—slightly alkaline or moderately alkaline

## Bigcanyon Series

The Bigcanyon series consists of moderately deep, somewhat excessively drained soils that formed in colluvium and residuum weathered from granitoid or gneiss. Bigcanyon soils are on mountains. Slopes range from 30 to 75 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Mixed, thermic Typic Torripsamments

### Typical Pedon

Bigcanyon sand; San Bernardino County, California; on a southwest-facing, 67 percent slope, approximately 3 miles east of Morongo Valley; approximately 1,692 meters east and 1,121 meters north of the southwest corner of section 30, T. 1 S., R. 5 E., San Bernardino Base and Meridian; at an elevation of 831 meters; lat. 34 degrees 03 minutes 26 seconds N. and long. 116 degrees 29 minutes 34 seconds W.; USGS Yucca Valley South, California 7.5 minute topographic quadrangle; UTM 11S 546804e 3768622n (DTM: NAD83). The surface is covered by approximately 35 percent fine gravel, 20 percent medium and coarse gravel, 3 percent cobbles, and 1 percent stones. (Colors are for dry soil unless otherwise stated.)

A—0 to 1 centimeter (0 to 0.5 inch); brown (10YR 5/3) sand, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; 4 percent fine gravel and 1 percent medium and coarse gravel; neutral (pH 7.2); abrupt smooth boundary. (1 to 4 centimeters thick)

C1—1 to 35 centimeters (0.5 inch to 14 inches); yellowish brown (10YR 5/4) coarse sand, brown (10YR 4/3) moist; single grain; loose, loose; nonsticky and nonplastic; many very fine and common fine roots; many very coarse tubular pores; 1 percent medium and coarse paragravel and 5 percent fine paragravel that breaks down to 4 percent medium and coarse gravel; neutral (pH 6.8); clear wavy boundary.

- C2—35 to 52 centimeters (14 to 20 inches); brown (10YR 5/3) parastony sand, dark brown (10YR 3/3) moist; single grain; loose, loose; nonsticky and nonplastic; many very fine roots; 5 percent parastones, 5 percent paracobbles, and 3 percent medium and coarse paragravel that break down to 5 percent fine gravel and 7 percent medium and coarse gravel; neutral (pH 7.2); clear irregular boundary. (Combined thickness of the C horizons is 49 to 75 centimeters)
- Cr—52 to 150 centimeters (20 to 60 inches); extremely weakly cemented granitoid bedrock with cracks more than 10 centimeters apart; moderate excavation difficulty; few very fine and fine roots in cracks and common very fine roots on top of horizon.

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 15 to 60 percent; dominantly gravel

*Depth to paralithic contact:* 50 to 100 centimeters (20 to 40 inches)

#### *Control section:*

Rock fragments—2 to 33 percent

Clay content—1 to 4 percent

Effervescence—noneffervescent throughout

#### *A horizon:*

Hue—10YR or 2.5Y

Value—5 or 6 dry; 3 or 4 moist

Chroma—2 or 3, dry or moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—1 to 5 percent

Rock fragments—5 to 15 percent; dominantly gravel

#### *Bw or C horizon:*

Hue—10YR or 2.5Y

Value—5 to 8 dry; 3 to 6 moist

Chroma—2 to 6 dry; 2 to 5 moist

Texture of the fine-earth fraction—coarse sand, sand, fine sand, or loamy sand

Clay content—1 to 4 percent

Rock fragments—2 to 33 percent; dominantly indurated gravel; including 0 to 14 percent pararock fragments ranging from medium-sized gravel to stones

Reaction—neutral or slightly alkaline

## Blackeagle Series

The Blackeagle series consists of shallow, somewhat excessively drained soils that formed in colluvium and/or residuum from gneissic and/or granitoid rocks. Blackeagle soils are on hills and mountains. Slopes range from 15 to 75 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

#### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplocambids

### Typical Pedon

Blackeagle gravel; Riverside County, California (in the park); on a north-facing, linear, 45 percent slope under desert shrubs; 76 meters (250 feet) east and 945 meters (3,100 feet) south of the northeast corner of section 36, T. 3 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 698 meters (2,290 feet); lat. 33 degrees 51 minutes 42 seconds N. and long. 115 degrees 39 minutes 54 seconds W.; USGS Conejo Well 7.5 minute topographic quadrangle; UTM 11S 623488e 3747612n (DTM: NAD83). The surface is covered by approximately 64 percent gravel, 20 percent cobbles, and 1 percent stones. (Colors are for dry soil unless otherwise noted.)

- C—0 to 5 centimeters (0 to 2 inches); gravel; 64 percent gravel, 20 percent cobbles, and 1 percent stones; abrupt smooth boundary. (4 to 20 centimeters thick)
- A—5 to 8 centimeters (2 to 3 inches); pale brown (10YR 6/3) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak thin platy structure parting to weak fine subangular blocky; soft, very friable; slightly sticky and slightly plastic; many very fine and few fine roots; few medium tubular pores; 50 percent gravel and 5 percent cobbles; slightly effervescent; neutral (pH 6.6); clear wavy boundary. (2 to 6 centimeters thick)
- AB—8 to 28 centimeters (3 to 11 inches); pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable; slightly sticky and slightly plastic; common very fine and few fine and medium roots; common fine tubular pores; 55 percent gravel and 20 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (0 to 20 centimeters thick)
- Bw—28 to 41 centimeters (11 to 16 inches); yellowish brown (10YR 5/6) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable; moderately sticky and moderately plastic; few fine and medium roots; 40 percent gravel and 5 percent cobbles; strongly effervescent; slightly alkaline (pH 7.8); clear irregular boundary. (15 to 35 centimeters thick)
- R—41 centimeters (16 inches); unweathered gneissic bedrock with high or very high excavation difficulty; a thin rind of paralithic material (0 to 4 centimeters thick) at the soil and rock interface.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 79 degrees F)

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 80 to 95 percent; including 60 to 65 percent gravel, 20 to 30 percent cobbles, 0 to 5 percent stones, and 0 to 2 percent boulders

*Control section:*

Depth to upper boundary of the cambic horizon—6 to 25 centimeters

Depth to a lithic contact—36 to 50 centimeters

*C horizon:*

In lieu of texture—gravel, cobbles, or stones

Rock fragments—80 to 95 percent; including 35 to 65 percent gravel, 20 to 40 percent cobbles, 1 to 20 percent stones, and 0 to 5 percent boulders

*A horizon:*

Hue—10YR or 2.5Y

Value—5 or 6 dry; 3 or 4 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—loamy sand, sandy loam, or fine sandy loam  
Clay content—4 to 12 percent  
Rock fragments—40 to 70 percent; dominantly gravel  
Effervescence—very slightly or slightly effervescent  
Reaction—slightly acid or neutral

*AB horizon (if it occurs):*

Chroma—3 or 4 dry  
Clay content—8 to 9 percent  
Rock fragments—45 to 75 percent; dominantly gravel  
Effervescence—strongly or violently effervescent

*Bw or Bk horizon:*

Value—5 or 6 dry  
Chroma—4 to 6 dry; 3 to 4 moist  
Texture of the fine-earth fraction—sandy loam or fine sandy loam  
Clay content—8 to 18 percent  
Rock fragments—35 to 65 percent; dominantly gravel  
Effervescence—slightly to violently effervescent  
Reaction—neutral or slightly alkaline  
Visible secondary carbonates—0 to 20 percent as coats on bottom of rock fragments and 0 to 3 percent as masses on bottom of rock fragments

## Blackmagic Series

The Blackmagic series consists of very deep, well drained soils that formed in dominantly igneous alluvium. Blackmagic soils are on alluvial fan remnants. Slopes range from 2 to 4 percent. The mean annual precipitation is about 5 inches, and the mean annual air temperature is about 64 degrees F.

### Taxonomic Classification

Fine-loamy, mixed, superactive, thermic Typic Calciargids

### Typical Pedon

Blackmagic association, 2 to 4 percent slopes; San Bernardino County, California, about 150 kilometers north of the survey area within Fort Irwin Military Reservation; about 12,325 feet north of the center of section 3, T. 14 N., R. 2 E. in an unsectionalized area; at an elevation of 3,540 feet; lat. 35 degrees 22 minutes 09 seconds N. and long. 116 degrees 45 minutes 19 seconds W.; USGS East of Goldstone 7.5 minute topographic quadrangle; UTM 11S 0522242e 3913817n (DTM: NAS-C). The surface is covered by a trace of stones, 5 percent cobbles, and 80 percent gravel. (When described on June 27, 1997, the soil was dry throughout.)

A—0 to 2 inches; pale brown (10YR 6/3) extremely gravelly silt loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable; nonsticky and nonplastic; many very fine and fine roots throughout; common very fine and fine interstitial and few fine vesicular pores; noneffervescent; 65 percent gravel, 5 percent cobbles, and a trace of stones; moderately alkaline (pH 7.9); clear wavy boundary. (2 to 4 inches thick)

Bt—2 to 5 inches; yellowish brown (10YR 5/4) gravelly silt loam, dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; moderately hard, firm; nonsticky and moderately plastic; many very fine and fine roots throughout; few very fine and fine tubular pores; 15 percent faint discontinuous clay films on faces of peds; very slightly effervescent; 25 percent gravel and 5 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary. (0 to 5 inches thick)

- Btk1—5 to 26 inches; yellowish brown (10YR 5/4) clay loam, brown (10YR 4/3) moist; strong coarse and very coarse prismatic structure; hard, firm; slightly sticky and moderately plastic; common very fine and fine roots throughout; common very fine and fine tubular pores; 35 percent faint discontinuous clay films on faces of peds; 1 percent threads and fine and medium soft masses of carbonate throughout; slightly effervescent; 1 percent gravel; moderately alkaline (pH 8.3); clear wavy boundary.
- Btk2—26 to 37 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, firm; slightly sticky and moderately plastic; common very fine and fine roots throughout; few very fine and fine tubular pores; 30 percent distinct discontinuous clay films on faces of peds; 3 percent medium and coarse soft masses of carbonate throughout and 5 percent carbonate coats on rock fragments; violently effervescent; 35 percent gravel and 3 percent cobbles; moderately alkaline (pH 8.2); gradual wavy boundary. (Combined thickness of the Btk horizons is 20 to 35 inches)
- Btky—37 to 45 inches; light yellowish brown (10YR 6/4) very gravelly loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; hard, firm; nonsticky and moderately plastic; few very fine and fine roots throughout; few very fine and fine tubular pores; 25 percent distinct discontinuous clay films throughout; 3 percent medium and coarse soft masses of carbonate throughout and 5 percent carbonate coats on rock fragments; 3 percent scattered pockets of gypsum occurring as soft masses on sides of peds; strongly effervescent; 45 percent gravel and 7 percent cobbles; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 10 inches thick)
- Bkq—45 to 60 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; few very fine and fine roots throughout; 15 percent medium and coarse soft masses of carbonate throughout and 5 percent carbonate coats on undersides of rock fragments; 15 percent strongly cemented discontinuous strata and strongly cemented and brittle durinodes; violently effervescent; 50 percent gravel and 10 percent cobbles; moderately alkaline (pH 8.2).

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and October following convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 63 to 68 degrees F

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 45 to 80 percent gravel, 5 to 30 percent cobbles, and 0 to 5 percent stones

#### *Control section:*

Clay content—18 to 30 percent

Rock fragments—average of 5 to 15 percent; mainly gravel and cobbles

Depth to secondary carbonates—less than 10 inches

#### *A horizon:*

Value—5 to 7 dry; 3 or 4 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—silt loam, fine sandy loam, or loam

Clay content—8 to 15 percent

Rock fragments—45 to 90 percent; including 5 to 70 percent gravel, 5 to 30 percent cobbles, and 0 to 5 percent stones



## Soil Survey of Joshua Tree National Park, California

Calcium carbonate equivalent—0 to 1 percent  
Effervescence—noneffervescent or very slightly effervescent  
Reaction—slightly alkaline or moderately alkaline

### *Bt horizon:*

Hue—7.5YR or 10YR  
Value—5 or 6 dry; 4 or 5 moist  
Chroma—3 or 4, dry or moist  
Clay content—12 to 18 percent  
Rock fragments—15 to 45 percent; including 15 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 2 percent stones  
Effervescence—noneffervescent or very slightly effervescent  
Reaction—slightly alkaline or moderately alkaline

### *Btk1 horizon:*

Hue—7.5YR or 10YR  
Value—5 or 6 dry; 4 or 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—silt loam, loam, or clay loam  
Clay content—18 to 30 percent  
Rock fragments—1 to 10 percent; including 1 to 10 percent gravel, 0 to 3 percent cobbles, and 0 to 2 percent stones  
Calcium carbonate equivalent—1 to 10 percent  
Effervescence—slightly to violently effervescent  
Reaction—moderately alkaline or strongly alkaline

### *Btk2 horizon:*

Hue—7.5YR or 10YR  
Value—5 or 6 dry; 4 or 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—silt loam, loam, or clay loam  
Clay content—18 to 30 percent  
Rock fragments—30 to 55 percent; including 30 to 55 percent gravel and 0 to 5 percent cobbles  
Calcium carbonate equivalent—1 to 10 percent  
Effervescence—slightly to violently effervescent  
Reaction—moderately alkaline or strongly alkaline

### *Btky horizon:*

Hue—7.5YR or 10YR  
Value—5 or 6 dry; 4 or 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—silt loam, loam, or clay loam  
Clay content—18 to 30 percent  
Rock fragments—30 to 55 percent; including 30 to 55 percent gravel and 0 to 10 percent cobbles  
Calcium carbonate equivalent—1 to 10 percent  
Effervescence—slightly to violently effervescent  
Reaction—moderately alkaline or strongly alkaline  
Gypsum—1 to 3 percent masses or crystals

### *Bkq horizon:*

Value—6 or 7 dry; 4 to 6 moist  
Chroma—3 or 4 moist  
Clay content—5 to 15 percent  
Rock fragments—45 to 85 percent; including 35 to 60 percent gravel, 10 to 30 percent cobbles, and 0 to 2 percent stones

Calcium carbonate equivalent—5 to 20 percent  
Effervescence—strongly or violently effervescent  
Reaction—moderately alkaline or strongly alkaline  
Durinodes—2 to 30 percent

## Bluecut Series

The Bluecut series consists of very deep, well drained soils that formed in alluvium derived from granite and gneiss or granitoid rocks. Bluecut soils are on fan aprons over fan remnants and on fan remnants. Slopes range from 2 to 8 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 15 degrees C (59 degrees F).

### Taxonomic Classification

Fine-loamy, mixed, superactive, thermic Typic Paleargids

### Typical Pedon

Bluecut loamy sand; San Bernardino County, California; on a linear, 8 percent slope, approximately 1.6 kilometers northwest of the turnoff of Park Boulevard for Split Rock Tank, in Joshua Tree National Park; about 710 meters south and 155 meters west of the northeast corner of section 9, T. 2 S., R. 9 E.; at an elevation of 1,196 meters; lat. 34 degrees 00 minutes 46 seconds N. and long. 116 degrees 02 minutes 18 seconds W.; USGS Queen Mountain, California 7.5 minute topographic quadrangle; UTM 11S 583498e 3754418n (DTM: NAD83). The surface is covered by approximately 50 percent fine gravel and 25 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 10 centimeters (0 to 4 inches); yellowish brown (10YR 5/4) loamy sand, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; few fine and common very fine roots throughout; common fine interstitial and few fine dendritic tubular pores; 8 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.6); gradual smooth boundary. (2 to 10 centimeters thick)

Bt—10 to 27 centimeters (4 to 11 inches); dark yellowish brown (10YR 4/6) loamy coarse sand, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; soft, very friable; slightly sticky and nonplastic; few fine and medium and common very fine roots throughout; few fine and common very fine dendritic tubular pores; 5 percent faint yellowish brown (10YR 5/4) clay bridges between sand grains; 8 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.6); abrupt smooth boundary. (0 to 33 centimeters thick)

2Bt1—27 to 53 centimeters (11 to 21 inches); strong brown (7.5YR 4/6) sandy clay loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; slightly hard, friable; moderately sticky and moderately plastic; common very fine roots throughout; common fine and many very fine interstitial pores; 25 percent distinct strong brown (7.5YR 4/6) clay films on faces of peds; 4 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.8); clear wavy boundary. (26 to 64 centimeters thick)

2Bt2—53 to 65 centimeters (21 to 26 inches); dark yellowish brown (10YR 4/6) sandy loam, dark yellowish brown (10YR 3/6) moist; weak coarse subangular blocky structure; slightly hard, very friable; slightly sticky and nonplastic; few very fine roots; common very fine interstitial pores; 10 percent faint dark yellowish brown (10YR 4/6) clay bridges between sand grains; 5 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.8); gradual wavy boundary. (0 to 90 centimeters thick)

- 2BCt—65 to 125 centimeters (26 to 50 inches); dark yellowish brown (10YR 4/6) very gravelly loamy coarse sand, dark yellowish brown (10YR 3/6) moist; moderate medium subangular blocky structure; slightly hard, friable; slightly sticky and nonplastic; few very fine roots throughout; common very fine interstitial pores; 15 percent faint dark yellowish brown (10YR 4/6) clay films on faces of peds; 25 percent fine gravel and 10 percent medium and coarse gravel; slightly alkaline (pH 7.8); gradual wavy boundary. (0 to 60 centimeters thick)
- 2C—125 to 200 centimeters (50 to 80 inches); yellowish brown (10YR 5/6) loamy coarse sand, dark yellowish brown (10YR 3/6) moist; massive; soft, very friable; nonsticky and nonplastic; 7 percent fine gravel and 3 percent medium and coarse gravel; slightly alkaline (pH 7.8).

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 15 to 22 degrees C

*Organic matter content:* 0 to 0.5 percent

*Depth to argillic horizon:* 25 to 50 centimeters

*Surface rock fragments:* 25 to 80 percent; including 25 to 50 percent fine gravel, 10 to 25 percent medium and coarse gravel, and 0 to 2 percent cobbles

#### *Control section:*

Rock fragments—2 to 15 percent gravel; dominantly 2 to 5 millimeters in size

Clay content—20 to 28 percent

Effervescence—noneffervescent or very slightly effervescent

#### *A horizon:*

Value—4 to 6 dry; 3 or 4 moist

Chroma—3 to 6 dry; 2 to 4 moist

Texture of the fine-earth fraction—loamy sand or sandy loam

Clay content—3 to 10 percent

Rock fragments—1 to 14 percent

Effervescence—noneffervescent or very slightly effervescent

#### *Bt horizon:*

Value—4 or 5 dry; 3 or 4 moist

Chroma—3 to 6 dry

Texture of the fine-earth fraction—loamy coarse sand, loamy sand, or sandy loam

Clay content—3 to 12 percent

Rock fragments—3 to 10 percent

Note—Bt horizons are not part of the argillic horizon as they do not have an appreciable increase in clay content from the overlying A horizon

#### *2Bt1 horizon:*

Hue—5YR or 7.5YR

Value—4 or 5 dry

Chroma—4 to 6 moist

Clay content—20 to 28 percent

Rock fragments—4 to 17 percent

Effervescence—noneffervescent to violently effervescent

#### *2Bt2 horizon and 2BCt horizon (if it occurs):*

Hue—5YR to 10YR

Value—4 or 5 dry; 3 to 5 moist

Chroma—6 or 8 dry

Texture of the fine-earth fraction—loamy sand, coarse sandy loam, or sandy loam  
Clay content—3 to 14 percent  
Rock fragments—5 to 35 percent

*2C horizon (if it occurs):*

Hue—7.5YR or 10YR  
Value—5 or 7 dry; 3 to 5 moist  
Chroma—4, 6, or 8 dry; 4 or 6 moist  
Texture of the fine-earth fraction—sand, loamy coarse sand, loamy sand, or sandy loam  
Clay content—2 to 12 percent  
Rock fragments—5 to 25 percent  
Effervescence—noneffervescent to strongly effervescent  
Reaction—slightly alkaline or moderately alkaline

## **Bolero Series**

The Bolero series consists of shallow, somewhat excessively drained soils that formed in colluvium and residuum from granitoid or gneissic rocks. Bolero soils are on mountains and hills. Slopes range from 15 to 75 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### **Taxonomic Classification**

Sandy-skeletal, mixed, hyperthermic Lithic Torriorthents

### **Typical Pedon**

Bolero cobbles; San Bernardino County, California; on an east-northeast-facing, linear, 53 percent slope under desert shrubs, approximately 3.6 kilometers southwest of the junction of Highway 62 and Iron Age Road; 45 meters (146 feet) north and 270 meters (875 feet) east of the southwest corner of section 13, T. 1 S., R. 12 E., San Bernardino Base and Meridian; at an elevation of 545 meters (1,766 feet); lat. 34 degrees 04 minutes 44.5 seconds N. and long. 115 degrees 40 minutes 56.3 seconds W.; USGS New Dale 7.5 minute topographic quadrangle; UTM 11S 0621578e 3771102n (DTM: NAD83). The surface is covered by approximately 20 percent fine gravel, 20 percent medium and coarse gravel, 30 percent cobbles, 18 percent stones, and 2 percent boulders. (Colors are for dry soil unless otherwise noted.)

C—0 to 15 centimeters (0 to 6 inches); cobbles; 20 percent fine gravel, 20 percent medium and coarse gravel, 28 percent cobbles, 15 percent stones, and 2 percent boulders; abrupt wavy boundary. (11 to 25 centimeters thick)

A—15 to 18 centimeters (6 to 7 inches); light yellowish brown (2.5Y 6/3) extremely gravelly loamy fine sand, olive brown (2.5Y 4/3) moist; moderate medium granular structure; slightly hard, very friable; nonsticky and nonplastic; few very fine and fine roots; 20 percent fine gravel, 25 percent medium and coarse gravel, 15 percent cobbles, and 5 percent stones; very slightly effervescent; moderately alkaline (pH 7.9); clear wavy boundary. (2 to 5 centimeters thick)

Bw—18 to 31 centimeters (7 to 12 inches); yellowish brown (10YR 5/4) very gravelly loamy fine sand, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure parting to massive; soft, very friable; nonsticky and nonplastic; few very fine and fine roots; 10 percent fine gravel, 20 percent medium and coarse gravel, and 10 percent cobbles; very slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 13 centimeters thick)

Bk—31 to 38 centimeters (12 to 15 inches); light yellowish brown (10YR 6/4) very gravelly loamy fine sand, yellowish brown (10YR 5/4) moist; moderate fine

subangular blocky structure; slightly hard, very friable; nonsticky and slightly plastic; 35 percent prominent very pale brown (10YR 7/3) calcium carbonate coats on bottom of rock fragments; common very fine and fine roots; 20 percent fine gravel, 20 percent medium and coarse gravel, and 10 percent cobbles; violently effervescent (6 percent calcium carbonate equivalent); moderately alkaline (pH 8.3); abrupt smooth boundary.

Ck—38 to 49 centimeters (15 to 19 inches); gravel; few very fine roots; fractured gneissic bedrock with loamy fine sand filling some fractures (fractures are less than 10 centimeters apart); 3 percent prominent very pale brown (10YR 7/3) calcium carbonate coats on rock fragments; 90 percent gravel and 5 percent cobbles; abrupt smooth boundary. (Combined thickness of the Bk and Ck horizons is 0 to 46 centimeters)

R—49 to 74 centimeters (19 to 30 inches); fractured gneissic bedrock; fractures are more than 10 centimeters apart.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 80 to 95 percent; including 20 to 50 percent gravel, 25 to 40 percent cobbles, 10 to 25 percent stones, and 0 to 5 percent boulders

#### *Control section:*

Rock fragments—average of 35 to 75 percent

Clay content—4 to 10 percent

*Organic matter content:* 0 to 0.5 percent

*Depth to a lithic contact:* 36 to 50 centimeters (14 to 20 inches)

#### *C horizon:*

Rock fragments—80 to 95 percent; including 20 to 50 percent gravel, 25 to 40 percent cobbles, 10 to 25 percent stones, and 0 to 5 percent boulders

#### *A horizon:*

Hue—10YR or 2.5Y

Value—5 or 6 dry; 4 or 5 moist

Clay content—2 to 6 percent

Rock fragments—35 to 75 percent; including 25 to 55 percent gravel, 5 to 25 percent cobbles, and 0 to 10 percent stones

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly alkaline or moderately alkaline

#### *Bw, Bk, and Ck horizons:*

Hue—10YR or 2.5Y

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Clay content—4 to 10 percent

Rock fragments—35 to 75 percent in the upper part of horizon and 35 to 95 percent in the lower part; including 30 to 90 percent gravel, 5 to 30 percent cobbles, and 0 to 5 percent stones

Effervescence—very slightly to violently effervescent

Calcium carbonate equivalent—0 to 10 percent

Reaction—slightly alkaline or moderately alkaline

Visible secondary carbonates—0 to 50 percent as coats on rock fragments and 0 to 5 percent as masses in the matrix



## Bulletproof Series

The Bulletproof series consists of shallow, somewhat excessively drained soils that formed in colluvium and residuum weathered from granitoid. Bulletproof soils are on mountains. Slopes range from 30 to 75 percent. The average annual precipitation is 100 millimeters (4 inches), and the average annual air temperature is 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Sandy, mixed, hyperthermic, shallow Typic Torriorthents

### Typical Pedon

Bulletproof cobbles; Riverside County, California; on a north-facing, 37 percent slope, approximately 12 miles north of the city of Indio; approximately 105 meters east and 1,475 meters north of the southwest corner of section 29, T. 3 S., R. 7 E., San Bernardino Base and Meridian; at an elevation of 474 meters; lat. 33 degrees 53 minutes 17.7 seconds N. and long. 116 degrees 16 minutes 55.7 seconds W.; USGS East Deception Canyon, California 7.5 minute topographic quadrangle; UTM 11S 566381e 3749997n (DTM: NAD83). The surface is covered by approximately 15 percent fine gravel, 30 percent medium and coarse gravel, 39 percent cobbles, and 1 percent stones. (When described, the soil was dry throughout.)

C—0 to 5 centimeters (0 to 2 inches); cobbles; 15 percent fine gravel, 30 percent medium and coarse gravel, 39 percent cobbles, and 1 percent stones; abrupt smooth boundary. (2 to 15 centimeters thick)

A—5 to 8 centimeters (2 to 3 inches); light olive brown (2.5Y 5/3) gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; weak thick platy structure parting to weak fine subangular blocky; slightly hard, very friable; nonsticky and nonplastic; common very fine irregular pores; 10 percent fine gravel and 20 percent medium and coarse gravel; slightly alkaline (pH 7.4); abrupt smooth boundary. (2 to 4 centimeters thick)

Bw—8 to 12 centimeters (3 to 5 inches); brown (10YR 5/3) loamy sand, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; common very fine irregular pores; 4 percent fine gravel and 8 percent medium and coarse gravel; noneffervescent; slightly alkaline (pH 7.4); clear smooth boundary. (0 to 32 centimeters thick)

C'—12 to 36 centimeters (5 to 14 inches); pale brown (10YR 6/3) loamy sand, grayish brown (10YR 5/2) moist; massive; soft, very friable; nonsticky and nonplastic; few very fine roots; few very fine irregular pores; 5 percent fine gravel, 5 percent fine paragravel, and 1 percent medium and coarse paragravel; very slightly effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (0 to 32 centimeters thick)

Crk—36 to 150 centimeters (14 to 60 inches); extremely weakly cemented soft granitoid bedrock with cracks more than 10 centimeters apart; moderately few very fine roots in mat at top of horizon; 20 percent white (10YR 8/1), dry, calcium carbonate coats on rock fragments; violently effervescent.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 79 degrees F)

*Surface rock fragments:* 80 to 95 percent; dominantly gravel

*Control section:*

Rock fragments—5 to 30 percent  
Clay content—1 to 10 percent  
*Organic matter content:* 0 to 0.5 percent  
*Depth to paralithic contact:* 25 to 36 centimeters (10 to 14 inches)

*C horizon:*

In lieu of texture—cobbles or gravel  
Rock fragments—80 to 95 percent; including 10 to 20 percent fine gravel, 15 to 70 percent medium and coarse gravel, 5 to 40 percent cobbles, and 1 to 15 percent stones

*A horizon:*

Hue—10YR or 2.5Y  
Value—5 or 6 dry; 3 or 4 moist  
Chroma—3 to 6 dry; 2 to 5 moist  
Clay content—1 to 8 percent  
Rock fragments—15 to 30 percent; dominantly gravel  
Effervescence—noneffervescent or very slightly effervescent  
Reaction—neutral to moderately alkaline

*Bw horizon or Btk horizon (if it occurs):*

Value—5 to 7 dry; 4 to 6 moist  
Chroma—2 to 4 dry; 2 or 3 moist  
Texture of the fine-earth fraction—loamy coarse sand or loamy sand  
Clay content—1 to 10 percent  
Rock fragments—6 to 30 percent; including 6 to 30 percent indurated gravel, 0 to 30 percent paragravel, and 0 to 15 paracobbles  
Effervescence—noneffervescent or very slightly effervescent  
Reaction—neutral to moderately alkaline

*C' horizon (if it occurs):*

Value—4 to 6 dry; 3 to 5 moist  
Chroma—3 to 6 dry; 2 to 4 moist  
Texture of the fine-earth fraction—fine sand or loamy sand  
Clay content—1 to 8 percent  
Rock fragments—4 to 25 percent; dominantly indurated gravel but including 0 to 6 percent paragravel  
Effervescence—noneffervescent to strongly effervescent  
Reaction—neutral to strongly alkaline

## **Burntshack Series**

The Burntshack series consists of very deep, well drained soils that formed in mixed alluvium dominantly from granitoid rocks. Burntshack soils are on alluvial fans over fan remnants and on fan aprons over fan remnants. Slopes range from 2 to 15 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### **Taxonomic Classification**

Loamy, mixed, superactive, thermic Arenic Haplargids

### **Typical Pedon**

Burntshack gravelly loamy sand; San Bernardino County, California, about 60 kilometers north of the survey area near the town of Lucrene Valley; on a linear-

convex, 2 percent slope, approximately 4 kilometers southeast of Camp Rock Road; approximately 650 meters south and 650 meters west of northeast corner of section 11, T. 5 N., R. 2 E., San Bernardino Base and Meridian; at an elevation of 1,020 meters; lat. 34 degrees 32 minutes 36.6 seconds N. and long. 116 degrees 44 minutes 43.9 seconds W.; USGS Fry Mountains 7.5 minute topographic quadrangle; UTM 11S 523348e 3822458n (DTM: NAD83). The surface is covered by approximately 25 percent gravel. (Colors are for dry soil unless otherwise noted.)

- A1—0 to 3 centimeters (0 to 1 inch); light yellowish brown (10YR 6/4) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; moderate medium platy structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; 15 percent gravel; very slightly effervescent; slightly alkaline (pH 7.4); clear wavy boundary.
- A2—3 to 14 centimeters (1 to 5.5 inches); light yellowish brown (10YR 6/4) loamy sand, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common very fine interstitial and common fine tubular pores; 10 percent gravel; very slightly effervescent; slightly alkaline (pH 7.8); gradual wavy boundary. (Combined thickness of A horizons is 3 to 18 centimeters)
- Bk—14 to 54 centimeters (5.5 to 21.5 inches); yellowish brown (10YR 5/6) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable; nonsticky and nonplastic; common very fine, fine, and medium roots; common very fine interstitial pores; 7 percent distinct white (10YR 8/1) and light gray (10YR 7/2) calcium carbonate films on bottom of rock fragments; 25 percent gravel; slightly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary. (40 to more than 50 centimeters thick)
- 2Bt—54 to 84 centimeters (21.5 to 33.5 inches); yellowish brown (10YR 5/6) loamy sand, dark yellowish brown (10YR 4/6) moist; weak medium subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial pores; 10 percent faint clay bridging between sand grains; 10 percent gravel; very slightly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (0 to 30 centimeters thick)
- 2Btk1—84 to 193 centimeters (33.5 to 77 inches); yellowish brown (10YR 5/6) sandy loam, dark yellowish brown (10YR 4/6) moist; moderate medium and coarse subangular blocky structure; hard, friable; slightly sticky and nonplastic; discontinuous pockets of loamy sand; common very fine roots; common very fine interstitial and fine tubular pores; 25 percent faint clay bridging between sand grains and 5 percent faint clay films on faces of peds; 2 percent medium prominent white (10YR 8/1) irregular calcium carbonate masses throughout the matrix, 3 percent fine distinct white (10YR 8/1) calcium carbonate threads on faces of peds, and 1 percent distinct white calcium carbonate films on bottom of rock fragments; 5 percent gravel; moderately alkaline (pH 8.2); clear wavy boundary.
- 2Btk2—193 to 200 centimeters (77 to 80 inches); light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, very firm; nonsticky and nonplastic; 25 percent distinct light yellowish brown (10YR 6/4) clay films on faces of peds; 50 percent coarse prominent very pale brown (10YR 8/2) spherical moderately cemented calcium carbonate nodules in the matrix; 20 percent gravel; strongly effervescent; moderately alkaline (pH 8.4). (Combined thickness of the 2Btk horizons is more than 50 centimeters)

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

## Soil Survey of Joshua Tree National Park, California

*Soil temperature:* 19 to 22 degrees C

*Surface rock fragments:* 20 to 65 percent gravel

*Control section:*

Rock fragments—5 to 25 percent; dominantly gravel

Clay content—average of 8 to 18 percent

Organic matter content—0 to 0.5 percent

Depth to upper boundary of argillic horizon—50 to 100 centimeters

*A and/or AB horizons:*

Hue—10YR or 2.5Y

Value—4 to 6, dry or moist

Chroma—3 or 4, dry or moist

Clay content—2 to 8 percent

Texture of the fine-earth fraction—coarse sand, sand, or loamy sand

Rock fragments—2 to 34 percent; dominantly gravel

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly alkaline or moderately alkaline

*Bw, Bk, Bkq, or C horizon:*

Hue—10YR or 7.5YR

Value—4 to 6 dry; 4 or 5 moist

Chroma—3 to 6 dry; 2 to 4 moist

Texture of the fine-earth fraction—coarse sand, sand, or loamy sand

Clay content—2 to 8 percent

Rock fragments—3 to 50 percent; dominantly gravel

Effervescence—very slightly to strongly effervescent

Calcium carbonate equivalent—0 to 1 percent

*2Bt horizon (if it occurs):*

Hue—10YR or 7.5YR

Value—5 or 6 dry

Chroma—4 or 6 dry; 3 to 6 moist

Clay content—2 to 8 percent

Rock fragments—5 to 50 percent; dominantly gravel

Effervescence—very slightly or slightly effervescent

Visible secondary carbonates—few threads throughout the matrix in some pedons

*2Btk horizon:*

Hue—10YR or 7.5YR

Value—4 to 6 dry

Chroma—3, 4, or 6, dry or moist

Clay content—average of 8 to 18 percent; ranging from 4 to 18 percent

Texture of the fine-earth fraction—loamy coarse sand, loamy sand, or sandy loam

Rock fragments—2 to 22 percent; dominantly gravel

Effervescence—noneffervescent to strongly effervescent

Calcium carbonate equivalent—1 to 5 percent

Reaction—slightly alkaline to strongly alkaline

Note—in some pedons the lower part of the 2Bt horizon has the necessary increase in clay content and oriented pedogenic clay required for an argillic horizon

*2C horizon (if it occurs):*

Hue—10YR or 7.5YR

Value—4 to 6, dry or moist

Chroma—4 to 6, dry or moist

Texture of the fine-earth fraction—sand, loamy coarse sand, or loamy sand

Clay content—2 to 6 percent

Rock fragments—5 to 15 percent; dominantly gravel

Reaction—slightly alkaline or moderately alkaline

## Buzzardsprings Series

The Buzzardsprings series consists of very deep, somewhat excessively drained soils that formed in alluvium from igneous rock. Buzzardsprings soils are on fan remnants. Slopes range from 2 to 30 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Sandy, mixed, hyperthermic Typic Haplocalcids

### Typical Pedon

Buzzardsprings gravelly fine sand; Riverside County, California; on a north-northwest-facing, linear, 4 percent slope under sparse desert shrubs; 305 meters (1,000 feet) south and 105 meters (345 feet) east of the northwest corner of section 14, T. 3 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 533 meters (1,750 feet); lat. 33 degrees 54 minutes 46 seconds N. and long. 115 degrees 48 minutes 21 seconds W.; USGS Pinto Mountain, California 7.5 minute topographic quadrangle; UTM 11S 0610410e 3753111n (DTM: NAD83). The surface is covered by approximately 10 percent fine gravel, 5 percent medium and coarse gravel, and 10 percent cobbles. (Colors are for dry soil unless otherwise noted.)

A—0 to 3 centimeters (0 to 1 inch); pale brown (10YR 6/3) gravelly fine sand, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable; nonsticky and nonplastic; few very fine roots; few fine vesicular and interstitial pores; 10 percent fine gravel, 5 percent medium and coarse gravel, and 2 percent cobbles; neutral (pH 7.0); clear wavy boundary. (2 to 4 centimeters thick)

Bk1—3 to 8 centimeters (1 to 3 inches); light yellowish brown (10YR 6/4) fine sand, yellowish brown (10YR 5/4) moist; weak thin platy structure parting to weak fine subangular; soft, very friable; nonsticky and nonplastic; common very fine and fine roots; few fine interstitial pores; 1 percent fine gravel; slightly effervescent; slightly alkaline (pH 7.8); gradual wavy boundary.

Bk2—8 to 21 centimeters (3 to 8 inches); light yellowish brown (10YR 6/4) loamy fine sand, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure parting to massive; soft, very friable; slightly sticky and slightly plastic; common very fine and fine and few medium roots; few fine interstitial pores; 1 percent fine gravel; violently effervescent; moderately alkaline (pH 8.0); gradual wavy boundary. (Combined thickness of the Bk horizons is 7 to 33 centimeters)

2Bk—21 to 58 centimeters (8 to 23 inches); very pale brown (10YR 7/3) sand, pale brown (10YR 6/3) moist; massive; soft, very friable; nonsticky and nonplastic; 10 percent fine very pale brown (10YR 8/2) irregular calcium carbonate masses in the matrix; common very fine and fine roots; few fine interstitial and tubular pores; 7 percent fine gravel and 3 percent medium and coarse gravel; strongly effervescent (calcium carbonate equivalent of 7.5); moderately alkaline (pH 8.1); gradual wavy boundary. (20 to 60 centimeters thick)

2Ck—58 to 152 centimeters (23 to 60 inches); pale brown (10YR 6/3) gravelly sand, yellowish brown (10YR 5/4) moist; single grain; loose; nonsticky and nonplastic; 5 percent thin very pale brown (10YR 8/2) calcium carbonate coats on rock fragments; common very fine and fine roots; 10 percent fine gravel, 2 percent medium and coarse gravel, and 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2).



**Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 80 degrees F)

*Surface rock fragments:* 15 to 80 percent; including 15 to 80 percent gravel and 0 to 40 percent cobbles

*Control section:*

Depth to the upper boundary of a calcic horizon—11 to 35 centimeters (4 to 14 inches)

Rock fragments—average of 5 to 20 percent; including 5 to 30 percent gravel and 0 to 5 percent cobbles

Clay content—average of 2 to 8 percent

Organic matter content—0 to 0.5 percent

*A horizon:*

Value—5 or 6 dry; 4 or 5 moist

Chroma—2 or 3, dry or moist

Texture of the fine-earth fraction—fine sand, loamy fine sand, or fine sandy loam

Clay content—1 to 8 percent

Rock fragments—3 to 35 percent; including 3 to 25 percent gravel and 0 to 5 percent cobbles

Effervescence—noneffervescent to violently effervescent

Reaction—neutral to moderately alkaline

*Bk horizon:*

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sand, fine sand, loamy sand, loamy fine sand, or sandy loam

Clay content—1 to 10 percent

Rock fragments—1 to 15 percent gravel

Effervescence—slightly to violently effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline or moderately alkaline

*2Bk horizon and 2Bkq horizon (if it occurs):*

Value—6 or 7 dry; 5 or 6 moist

Chroma—2 or 3 dry; 3 or 4 moist

Texture of the fine-earth fraction—sand or sandy loam

Clay content—1 to 10 percent

Rock fragments—5 to 32 percent gravel

Effervescence—strongly or violently effervescent

Calcium carbonate equivalent—5 to 10 percent

Visible secondary carbonates—2 to 10 percent as masses and 0 to 2 percent as indurated nodules in the matrix

Silica—0 to 5 percent as pendants on bottom of rock fragments

Reaction—slightly alkaline to strongly alkaline

*2Ck horizon and 2Ckq horizon (if it occurs):*

Value—5 or 6 dry; 4 or 5 moist

Chroma—2 or 3 dry; 3 or 4 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—1 to 6 percent

Rock fragments—5 to 32 percent; including 5 to 30 percent gravel and 0 to 5 percent cobbles  
Effervescence—slightly to violently effervescent  
Calcium carbonate equivalent—0 to 5 percent  
Reaction—slightly alkaline to strongly alkaline  
Visible secondary carbonates—2 to 10 percent as masses in the matrix  
Silica—0 to 5 percent as pendants on bottom of rock fragments

## Cajon Series

The Cajon series consists of very deep, somewhat excessively drained soils that formed in alluvium from dominantly granitoid rocks. Cajon soils are on fan aprons and inset fans. Slopes range from 1 to 8 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Mixed, thermic Typic Torripsamments

### Typical Pedon

Cajon-Golddivide complex, 2 to 8 percent slopes; San Bernardino County, California; 165 meters south and 345 meters west of the northeast corner of section 12, T. 4 S., R. 11 E; at an elevation of 731 meters (2,400 feet); lat. 33 degrees 50 minutes 38 seconds N. and long. 115 degrees 45 minutes 36 seconds W.; USGS Porcupine Wash, California 7.5 minute topographic quadrangle; UTM 11S 613167e 3745527n (DTM: NAD83). The surface is covered by 40 percent gravel. (Colors are for dry soil unless otherwise noted.)

- A—0 to 2 centimeters (0 to 1 inch); light yellowish brown (10YR 6/4) gravelly sand, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable; nonsticky and nonplastic; common very fine and fine roots; 30 percent gravel; very slightly effervescent; neutral (pH 6.8); clear wavy boundary.
- C1—2 to 9 centimeters (1 to 4 inches); light pale brown (10YR 6/3) gravelly sand, brown (10YR 4/3) moist; single grain; loose; nonsticky and nonplastic; common very fine and fine roots; 20 percent gravel; slightly effervescent; neutral (pH 6.8); clear wavy boundary.
- C2—9 to 50 centimeters (4 to 20 inches); light yellowish brown (10YR 6/4) gravelly sand, brown (10YR 4/3) moist; single grain; loose; nonsticky and nonplastic; common fine and very fine roots; 25 percent gravel; slightly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.
- C3—50 to 150 centimeters (20 to 60 inches); pale brown (10YR 6/3) gravelly sand, dark grayish brown (10YR 4/2) moist; single grain; loose; nonsticky and nonplastic; 20 percent gravel; very slightly effervescent; slightly alkaline (pH 7.8).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 20 to 70 percent gravel

*Control section:*

Rock fragments—10 to 30 percent gravel  
Clay content—1 to 7 percent

*A horizon:*

Hue—10YR or 2.5Y  
Value—5 to 7 dry; 3 to 5 moist  
Chroma—2 to 4 dry; 1 to 4 moist  
Texture of the fine-earth fraction—sand or loamy sand  
Clay content—1 to 7 percent  
Rock fragments—4 to 30 percent gravel  
Effervescence—noneffervescent or very slightly effervescent

*C horizon(s):*

Hue—10YR or 2.5YR  
Value—5 to 7 dry; 3 to 5 moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, or loamy sand  
Clay content—1 to 7 percent  
Rock fragments—5 to 35 percent gravel  
Effervescence—noneffervescent to strongly effervescent

## **Cambidic Haplodurids**

Cambidic Haplodurids consist of shallow, well drained soils that formed in alluvium from igneous and metamorphic rocks. These soils are on fan remnants, fan aprons, and fan skirts. Slopes range from 4 to 15 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### **Taxonomic Classification**

Cambidic Haplodurids

#### **Typical Pedon**

Carrizo-Cambidic Haplodurids complex, 4 to 15 percent slopes; Riverside County, California; about 435 meters (1,425 feet) north and 610 meters (2,000 feet) east of the southwest corner of section 14, T. 4 S., R. 16 E., San Bernardino Base and Meridian; at an elevation of 160 meters (525 feet); lat. 33 degrees 44 minutes 13.4 seconds N. and long. 115 degrees 16 minutes 27.4 seconds W.; USGS East of Victory Pass, California 7.5 minute topographic quadrangle; UTM 11S 0659712e 3743577n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 5 centimeters (0 to 2 inches); gravel; 50 percent fine gravel, 15 percent medium and coarse gravel, and 25 percent cobbles.

A—5 to 6 centimeters (2 to 2.5 inches); light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure; slightly hard, friable; nonsticky and slightly plastic; common very fine and fine and few medium and coarse vesicular pores; 10 percent fine gravel, 10 percent medium and coarse gravel, and 3 percent cobbles; strongly effervescent; slightly alkaline (pH 7.5); abrupt wavy boundary.

Bw—6 to 12 centimeters (2.5 to 5 inches); brown (7.5YR 5/4) gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive parting to weak fine subangular blocky structure; moderately hard, friable; slightly sticky and slightly plastic; 2 percent faint brown (7.5YR 5/4) clay films on faces of peds; few very fine roots; common very fine and fine interstitial pores; 5 percent fine gravel and 10 percent medium and coarse gravel; strongly effervescent; slightly alkaline (pH 7.5); abrupt wavy boundary.

- Bk—12 to 40 centimeters (5 to 16 inches); light brownish gray (10YR 6/2) extremely gravelly loamy sand, brown (10YR 4/3) moist; massive; slightly hard, very friable; nonsticky and nonplastic; 3 percent very pale brown (10YR 8/2) medium irregular calcium carbonate masses in the matrix; few very fine roots; 25 percent fine gravel, 40 percent medium and coarse gravel, and 10 percent cobbles; strongly effervescent; neutral (pH 7.3); abrupt wavy boundary.
- Bkq—40 to 52 centimeters (16 to 20 inches); light brownish gray (10YR 6/2) moderately cemented loamy sand, brown (10YR 4/3) moist; duripan with 70 percent cementation; massive; very hard, very firm; nonsticky and nonplastic; clear wavy boundary.
- C'—52 to 152 centimeters (20 to 60 inches); pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; single grain; loose; nonsticky and nonplastic; 30 percent fine gravel, 15 percent medium and coarse gravel, and 5 percent cobbles; slightly effervescent; neutral (pH 7.3).

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (71.5 to 77 degrees F)

*Control section:*

- Rock fragments—average of 50 to 80 percent; including 50 to 70 percent gravel and 0 to 10 percent cobbles
- Organic matter content: 0 to 0.5 percent
- Clay content—average of 2 to 6 percent
- Depth to the upper boundary of a duripan—36 to 50 centimeters (14 to 20 inches)

*C horizon:*

- Rock fragments—80 to 90 percent; including 15 to 50 percent fine gravel, 25 to 50 percent medium and coarse gravel, and 0 to 25 percent cobbles

*A horizon:*

- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 3 or 4 moist
- Chroma—3 or 4, dry or moist
- Texture of the fine-earth fraction—sand or loam
- Clay content—1 to 12 percent
- Rock fragments—15 to 35 percent; including 15 to 25 percent gravel and 0 to 5 percent cobbles
- Reaction—slightly alkaline or moderately alkaline
- Note—A horizons are characterized by vesicular pores

*Bw, Bk, Bkq, and C' horizons:*

- Hue—7.5YR, 10YR, or 2.5Y
- Value—5 or 6 dry; 3 or 4 moist
- Chroma—2 to 4, dry or moist
- Texture of the fine-earth fraction—sand, loamy sand, or fine sandy loam
- Clay content—1 to 10 percent
- Rock fragments—15 to 80 percent; including 15 to 70 percent gravel and 0 to 10 percent cobbles
- Visible secondary carbonates—0 to 5 percent as masses within the matrix
- Reaction—neutral to moderately alkaline
- Silica—0 to 20 percent as durinodes in the matrix
- Cementation—50 to 70 percent continuous, weak to moderate

## Carpetflat Series

The Carpetflat series consists of very shallow and shallow, somewhat excessively drained soils that formed in alluvium from granitoid rocks. Carpetflat soils are on summits of fan remnants. Slopes range from 0 to 4 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids

### Typical Pedon

Carpetflat gravel; Riverside County, California; on a west-facing, linear, 1 percent slope under desert shrubs, in Joshua Tree National Park; 770 meters (2,525 feet) west and 735 meters (2,411 feet) south of the northeast corner of section 33, T. 3 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 631 meters (2,071 feet); lat. 33 degrees 52 minutes 01.6 seconds N. and long. 115 degrees 37 minutes 30.1 seconds W.; USGS Conejo Well, California 7.5 minute topographic quadrangle; UTM 11S 0627177e 3748273n (DTM: NAD83). (Colors are for dry soil unless otherwise noted).

C—0 to 6 centimeters (0 to 2.5 inches); gravel; approximately 40 percent fine gravel, 32 percent medium and coarse gravel, 20 percent cobbles, and 3 percent stones; abrupt wavy boundary. (0 to 7 centimeters thick)

A—6 to 11 centimeters (2.5 to 4.5 inches); pale brown (10YR 6/3) gravelly silt loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure; hard, very friable; moderately sticky and moderately plastic; very few very fine roots; many fine vesicular pores; 10 percent fine gravel, 5 percent medium and coarse gravel, and 3 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (2 to 6 centimeters thick)

Bw—11 to 19 centimeters (4.5 to 7.5 inches); pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure parting to weak fine subangular blocky; slightly hard, firm; nonsticky and nonplastic; few fine tubular pores; 30 percent fine gravel, 20 percent medium and coarse gravel, and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (0 to 14 centimeters thick)

Bk—19 to 34 centimeters (7.5 to 13.5 inches); pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; loose; slightly sticky and slightly plastic; 2 percent fine carbonate filaments throughout the matrix and 3 percent thick carbonate coats on bottom of rock fragments; few very fine and fine tubular pores; 20 percent fine gravel, 10 percent medium and coarse gravel, and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 26 centimeters thick)

Bkqm1—34 to 41 centimeters (13.5 to 16 inches); very pale brown (10YR 8/2) weakly to moderately cemented loamy sand, very pale brown (10YR 7/3) moist; duripan with 95 percent cementation; massive; moderately hard, firm, brittle; violently effervescent.

Bkqm2—41 to 66 centimeters (16 to 26 inches); very pale brown (10YR 8/2) very strongly cemented (100 percent cementation) duripan, very pale brown (10YR 7/3) moist; massive; extremely hard, very firm, brittle; violently effervescent.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime



## Soil Survey of Joshua Tree National Park, California

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 70 to 100 percent; including 60 to 80 percent gravel, 10 to 25 percent cobbles, and 0 to 5 percent stones

*Control section:*

Rock fragments—average of 35 to 50 percent

Clay content—8 to 12 percent

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of a duripan—18 to 36 centimeters (7 to 14 inches)

*C horizon (if it occurs):*

Rock fragments—80 to 100 percent; including 60 to 80 percent gravel, 10 to 25 percent cobbles, and 0 to 5 percent stones

*A horizon:*

Hue—7.5YR, 10YR, or 2.5Y

Value—6 to 8 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—fine sand, sandy loam, or silt loam

Clay content—1 to 20 percent

Rock fragments—15 to 55 percent; including 15 to 45 percent gravel and 0 to 10 percent cobbles

Effervescence—strongly or violently effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—moderately alkaline or strongly alkaline

Note—some pedons are characterized by vesicular pores in this horizon

*Bw and/or Bk horizons (if they occur):*

Hue—7.5YR or 10YR

Value—6 or 7 dry; 4 or 5 moist

Chroma—3 or 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—sandy loam or silt loam

Clay content—8 to 12 percent

Rock fragments—20 to 55 percent; including 20 to 55 percent gravel and 0 to 5 percent cobbles

Calcium carbonate equivalent—0 to 10 percent

Visible secondary carbonates—0 to 20 percent as coats on rock fragments

*Bkq or Bkqm horizon:*

Hue—7.5YR or 10YR

Chroma—1 or 2 dry; 1 to 3 moist

Cementation—weak to moderate in the upper part of horizon and very strong in the lower part; 50 to 100 percent continuity

In map unit 2068, the Carpetflat soils are considered a taxadjunct to the series. These soils differ from the Carpetflat series because they are less than strongly cemented and are not skeletal, averaging 20 percent rock fragments. These differences, however, do not affect the use and management of the soils.

## Carrizo Series

The Carrizo series consists of very deep, excessively drained soils that formed in mixed igneous alluvium. Carrizo soils are on numerous landforms on flood plains, fan piedmonts, and bolson floors. Slopes range from 0 to 15 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

### Typical Pedon

Carrizo extremely gravelly sand, rangeland and wildlife habitat; San Bernardino County, California, approximately 16 kilometers north of the survey area; approximately 18.5 kilometers (11.5 miles) southwest of the town of Amboy; about 610 meters (2,000 feet) south and 305 meters (1,000 feet) west of the northeast corner of section 18, T. 4 N., R. 11 E., San Bernardino Base and Meridian; lat. 34 degrees 26 minutes 11.1 seconds N. and long. 115 degrees 51 minutes 47.8 seconds W.; USGS Lead Mountain Northeast, California 7.5 minute topographic quadrangle; UTM 11S 0604440e 3810938n (DTM: NAD83). The surface is covered by approximately 70 percent gravel, 6 percent cobbles, and 4 percent stones. (Colors are for dry soil unless otherwise noted.)

- A—0 to 5 centimeters (0 to 2 inches); pale brown (10YR 6/3) extremely gravelly sand, brown (10YR 4/3) moist; massive; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; 55 percent gravel, 6 percent cobbles, and 4 percent stones; slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (2.5 to 10 centimeters thick)
- C—5 to 152 centimeters (2 to 60 inches); pale brown (10YR 6/3) stratified extremely gravelly and very gravelly coarse sand, brown (10YR 4/3) moist; massive to single grain; soft, slightly hard, or loose, very friable; nonsticky and nonplastic; common very fine and few fine roots; many very fine and few fine and medium interstitial pores; average of 55 percent gravel, 10 percent cobbles, and 5 percent stones; very slightly and slightly effervescent; moderately alkaline (pH 8.4) and slightly alkaline (pH 7.8).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 25 to 100 percent; including 25 to 95 percent gravel, 0 to 40 percent cobbles, 0 to 25 percent stones, and 0 to 2 percent boulders

#### *Control section:*

Rock fragments—average of 35 to 80 percent; gravel, cobbles, and stones

Clay content—average of 0 to 8 percent

Effervescence—noneffervescent to violently effervescent

Reaction—slightly acid to strongly alkaline

#### *A horizon:*

Hue—7.5YR, 10YR or 2.5Y

Value—4 to 7 dry; 2 to 6 moist

Chroma—2 to 6 dry; 2 to 4 moist

Clay content—1 to 10 percent

Texture of the fine-earth fraction—sand, loamy sand, sandy loam, or fine sandy loam

Rock fragments—5 to 65 percent; including 5 to 65 percent gravel, 0 to 25 percent cobbles, and 0 to 5 percent stones

Effervescence—noneffervescent to violently effervescent

Reaction—slightly acid to strongly alkaline

*C horizon:*

Hue—7.5YR, 10YR, or 2.5Y

Value—4 to 7 dry; 2 to 6 moist

Chroma—2 to 6 dry; 2 to 4 moist

Clay content—average of 0 to 8 percent; ranging from 0 to 12 percent

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, or loamy sand; in some pedons horizon has thin strata of fine sand, loamy fine sand, or sandy loam

Rock fragments—10 to 85 percent; including 10 to 80 percent gravel (more than 50 percent of which are medium or coarse sized), 0 to 25 percent cobbles, and 0 to 10 percent stones

Effervescence—noneffervescent to violently effervescent

Reaction—slightly acid to strongly alkaline

Silica—0 to 25 percent as films on rock fragments

## Carsitas Series

The Carsitas series consists of very deep, somewhat excessively drained soils that formed in alluvium from granitoid and/or gneissic rocks. Carsitas soils are on alluvial fans, fan aprons, valley fills, and dissected remnants of alluvial fans and in drainageways. Slopes range from 0 to 30 percent. The mean annual precipitation is about 75 millimeters (3 inches), and the mean annual air temperature is about 25 degrees C (77 degrees F).

### Taxonomic Classification

Mixed, hyperthermic Typic Torripsamments

### Typical Pedon

Carsitas gravelly sand; Riverside County, California, approximately 16 kilometers south of the survey area in the city of Indio; under desert shrubs, approximately 1.6 kilometers (1 mile) east of Cleveland Avenue on Avenue 70; about 183 meters (600 feet) west of the northeast corner of section 28, T. 7 S., R. 10 E., San Bernardino Base and Meridian; lat. 33 degrees 32 minutes 22.9 seconds N. and long. 115 degrees 56 minutes 28.3 seconds W.; USGS Mortmar, California 7.5 minute topographic quadrangle; UTM 11S 0598304e 3711622n (DTM: NAD83). (Colors are for dry soil unless otherwise noted).

C1—0 to 25 centimeters (0 to 10 inches); light olive gray (5Y 6/2) gravelly sand, olive gray (5Y 4/2) moist; stratified; single grain; loose; few coarse and fine roots; common fine interstitial pores; 16 percent gravel; slightly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (5 to 38 centimeters thick)

C2—25 to 152 centimeters (10 to 60 inches); light olive gray (5Y 6/2) gravelly coarse sand, olive gray (5Y 4/2) moist; stratified; single grain; loose; very few fine and coarse roots; common fine interstitial pores; 20 percent gravel; slightly effervescent, moderately alkaline (pH 8.4).

### Range in Characteristics

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some part during winter, summer, and early fall; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (77 to 82 degrees F)

*Surface rock fragments:* 40 to 95 percent; including 35 to 95 percent gravel, 0 to 20 percent cobbles, and 0 to 5 percent stones

*Control section:*

Rock fragments—average of 15 to 35 percent; including 7 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 2 percent stones  
Clay content—1 to 6 percent  
Organic matter content—0 to 0.5 percent  
Effervescence—effervescent below a depth of 25 centimeters in all pedons

*A horizon (if it occurs):*

Hue—10YR, 2.5Y, or 5Y  
Value—4 to 7, dry or moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—sand, loamy coarse sand, loamy sand, or sandy loam  
Clay content—0 to 7 percent  
Rock fragments—5 to 40 percent; including 5 to 35 percent gravel and 0 to 5 percent cobbles  
Effervescence—noneffervescent to slightly effervescent  
Reaction—neutral to moderately alkaline

*Bw horizon (if it occurs):*

Hue—7.5YR or 10YR  
Value—5 or 6 dry; 3 to 5 moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—loamy coarse sand, loamy sand, or sandy loam  
Clay content—2 to 7 percent  
Rock fragments—8 to 25 percent; including 8 to 20 percent gravel, 0 to 10 percent cobbles, and 0 to 2 percent stones  
Effervescence—noneffervescent to strongly effervescent  
Reaction—slightly alkaline or moderately alkaline  
Note—this horizon is either too thin, is the wrong texture, has insufficient calcium carbonate, or fails to meet some other necessary requirement to be classified as a diagnostic horizon

*C, Ck, Ckq, and Cq horizons:*

Hue—10YR, 2.5Y, or 5Y  
Value—4 to 7 dry; 3 to 7 moist  
Chroma—2 to 6, dry or moist  
Texture—coarse sand, sand, loamy coarse sand, or loamy sand  
Clay content—0 to 5 percent  
Rock fragments—7 to 35 percent; including 7 to 35 percent gravel and 0 to 5 percent cobbles  
Effervescence—very slightly to violently effervescent  
Visible secondary carbonates—0 to 5 percent as coats on rock fragments  
Reaction—slightly alkaline or moderately alkaline  
Silica—0 to 5 percent as films on rock fragments

## **Catfishbay Series**

The Catfishbay series consists of very deep, well drained soils that formed in alluvium derived from igneous and metamorphic rock. Catfishbay soils are on fan remnants. Slopes range from 0 to 15 percent. The mean annual precipitation is about 75 millimeters (about 3 inches), and the mean annual air temperature is about 25 degrees C (77 degrees F).

### **Taxonomic Classification**

Coarse-loamy, mixed, superactive, hyperthermic Typic Calciargids

### Typical Pedon

Catfishbay sandy loam; San Bernardino County, California; on an east-facing, 2 percent slope, 1 kilometer east and 6 kilometers north of Havasu Lake, California, next to the Colorado River; 680 meters east and 300 meters north of the southwest corner of section 7, T. 5 N., R. 25 E; at an elevation of 150 meters (about 500 feet); lat. 34 degrees 32 minutes 19 seconds N. and long. 114 degrees 24 minutes 04 seconds W.; USGS Castle Rock, Arizona 7.5 minute topographic quadrangle; UTM 11S 738507e 3824962n (DTM: NAD 83). The surface is covered by 70 percent gravel. (When described on June 11, 2008, the soil was dry throughout.)

- A—0 to 5 centimeters (0 to 2 inches); light brown (7.5YR 6/4) sandy loam, brown (7.5YR 4/4) moist; weak thick platy structure; slightly hard, very friable; slightly sticky and nonplastic; common very fine interstitial and many very fine vesicular pores; 5 percent fine gravel and 5 percent medium and coarse gravel; violent effervescence; moderately alkaline (pH 8.2); abrupt wavy boundary. (2 to 7 centimeters thick)
- Btkq1—5 to 49 centimeters (2 to 19 inches); light brown (7.5YR 6/4) sandy loam, strong brown (7.5YR 4/6) moist; weak very coarse subangular blocky structure; moderately hard, very friable; slightly sticky and slightly plastic; few very fine roots; few fine tubular and many very fine interstitial pores; 2 percent faint strong brown (7.5YR 5/6), dry, clay films between sand grains and 2 percent faint strong brown (7.5YR 5/6), dry, clay films on rock fragments; 2 percent faint brownish yellow (10YR 6/6), dry, silica on bottom of rock fragments; 10 percent coarse prominent irregular white (10YR 8/1), dry, carbonate masses with sharp boundaries in the matrix; 2 percent fine gravel and 3 percent medium and coarse gravel; violent effervescence; moderately alkaline (pH 8.2); clear smooth boundary. (40 to 90 centimeters thick)
- Btkq2—49 to 76 centimeters (19 to 30 inches); brown (7.5YR 5/4) sand, strong brown (7.5YR 4/6) moist; weak very coarse subangular blocky structure; moderately hard, very friable; nonsticky and nonplastic; few fine tubular and many very fine interstitial pores; 2 percent faint strong brown (7.5YR 5/6), dry, clay films between sand grains, 2 percent faint strong brown (7.5YR 5/6), dry, clay films on rock fragments, and 2 percent faint brownish yellow (10YR 6/6), dry, silica on bottom of rock fragments; 5 percent medium prominent irregular white (10YR 8/1), dry, carbonate masses with sharp boundaries in the matrix; 5 percent fine gravel and 5 percent medium and coarse gravel; violent effervescence; moderately alkaline (pH 8.0); abrupt smooth boundary.
- Btkq3—76 to 114 centimeters (30 to 45 inches); brown (7.5YR 5/4) gravelly sand, brown (7.5YR 4/4) moist; weak very coarse subangular blocky structure; moderately hard, very friable; nonsticky and nonplastic; few fine tubular and many very fine interstitial pores; 2 percent faint strong brown (7.5YR 5/6), dry, clay films between sand grains and 2 percent faint strong brown (7.5YR 5/6), dry, clay films on rock fragments; 2 percent faint brownish yellow (10YR 6/6), dry, silica on bottom of rock fragments; 1 percent fine prominent threadlike white (10YR 8/1), dry, carbonate masses with clear boundaries on surfaces along pores; 5 percent fine gravel and 15 percent medium and coarse gravel; violent effervescence; moderately alkaline (pH 8.0); abrupt wavy boundary.
- Bkq—114 to 150 centimeters (45 to 59 inches); pale brown (10YR 6/3) gravelly sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable; nonsticky and nonplastic; common fine interstitial and many very fine interstitial pores; 2 percent faint brownish yellow (10YR 6/6), dry, silica on bottom of rock fragments; 10 percent very coarse prominent irregular very pale brown (10YR 7/3), dry, carbonate masses with diffuse boundaries in the matrix; 10 percent fine gravel and 20 percent medium and coarse gravel; violent effervescence; moderately



alkaline (pH 8.0). (Combined thickness of the lower B horizons is 50 to 110 centimeters)

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some part during summer or winter; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (about 77 to 82 degrees F)

*Organic matter content:* 0 to 0.5 percent

*Depth to argillic and calcic horizons:* 3 to 25 centimeters

#### *Control section:*

Rock fragments—0 to 25 percent gravel, dominantly 2 to 40 millimeters in size

Clay content—9 to 18 percent

#### *A horizon(s):*

Hue—7.5YR or 10YR

Value—4 or 5 moist

Chroma—3 or 4 dry

Texture of the fine-earth fraction—loamy fine sand, sandy loam, or fine sandy loam

Clay content—3 to 10 percent

Rock fragments—5 to 15 percent

Reaction—slightly alkaline or moderately alkaline

#### *Bk or Bkq horizon (if it occurs):*

Hue—7.5YR or 10YR

Value—6 dry

Chroma—3 or 4 dry

Texture of the fine-earth fraction—loamy fine sand or sandy loam

Clay content—4 to 9 percent

Rock fragments—0 to 30 percent gravel

Reaction—slightly alkaline or moderately alkaline

#### *Btkq1 and Btk1 horizons (if they occur):*

Value—5 or 6 dry; 4 or 5 moist

Chroma—4 or 6 dry

Texture of the fine-earth fraction—sandy loam or fine sandy loam

Clay content—9 to 16 percent

Rock fragments—0 to 25 percent

#### *Btkq2, Btkq3, and/or Btq horizon(s):*

Hue—10YR or 7.5YR

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 or 4 dry; 3, 4, or 6 moist

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, sand, or loamy sand

Clay content—2 to 6 percent

Rock fragments—average of 0 to 35 percent; ranging from 0 to 60 percent

Reaction—moderately alkaline or strongly alkaline

## **Chemwash Series**

The Chemwash series consists of very deep, excessively drained soils that formed in alluvium derived from mixed igneous and/or metamorphic rocks. Chemwash soils are on inset fans, fan aprons, and alluvial fans and in drainageways. Slopes range from 2 to 8 percent. The mean annual precipitation is about 75 millimeters (3 inches), and the mean annual air temperature is about 25 degrees C (77 degrees F).

### **Taxonomic Classification**

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

### **Typical Pedon**

Chemwash very gravelly loamy coarse sand; San Bernardino County, California; on a 2 percent slope under desert shrubs, about 10 kilometers west-southwest of Lake Havasu City, Arizona, at the east end of Chemehuevi Wash, approximately 1.5 kilometers south and 0.5 kilometer west of Havasu Lake, California; 230 meters south and 200 meters east of the northwest corner of section 1, T. 4 N., R. 24 E.; USGS Havasu Lake, California-Arizona 7.5 minute topographic quadrangle; at an elevation of 157 meters (about 510 feet); lat. 34 degrees 28 minutes 06.84 seconds N. and long. 114 degrees 25 minutes 22.08 seconds W.; UTM 11S 736712e 3817126n (DTM: NAD83). The surface is covered by approximately 30 percent fine gravel, 5 percent medium and coarse gravel, and 1 percent cobbles. (Colors are for dry soil unless otherwise noted.)

- A—0 to 6 centimeters (0 to 2 inches); yellowish brown (10YR 5/4) very gravelly loamy coarse sand, brown (10YR 5/3) moist; massive; soft, very friable; nonsticky and nonplastic; many fine roots; common fine irregular pores; 30 percent fine gravel and 5 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 7 centimeters thick)
- C1—6 to 20 centimeters (2 to 8 inches); pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable; nonsticky and nonplastic; many very fine roots; common very fine irregular pores; 10 percent fine gravel and 5 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.
- C2—20 to 38 centimeters (8 to 15 inches); pale brown (10YR 6/3) very gravelly coarse sand, brown (10YR 5/3) moist; single grain; loose; nonsticky and nonplastic; many very fine and common medium and coarse roots; common very fine irregular pores; 25 percent fine gravel and 10 percent medium and coarse gravel; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.
- C3—38 to 63 centimeters (15 to 25 inches); pale brown (10YR 6/3) very gravelly coarse sand, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable; nonsticky and nonplastic; many fine and medium roots; common very fine irregular pores; 40 percent fine gravel and 10 percent medium and coarse gravel; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.
- C4—63 to 113 centimeters (25 to 45 inches); light yellowish brown (10YR 6/4) stratified very gravelly coarse sand to extremely gravelly coarse sand, brown (10YR 5/3) moist; massive; moderately hard, very friable; nonsticky and nonplastic; many medium roots; common very fine irregular pores; average of 40 percent fine gravel and 10 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.
- C5—113 to 170 centimeters (45 to 67 inches); yellowish brown (10YR 5/4) very gravelly coarse sand, brown (10YR 5/3) moist; massive; moderately hard, very friable; nonsticky and nonplastic; common very fine irregular pores; 35 percent fine gravel and 5 percent medium and coarse gravel; very slightly effervescent; moderately alkaline (pH 8.0). (Combined thickness of the C horizons is 140 to 175 centimeters)

### **Range in Characteristics**

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some part during summer or winter; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (about 77 to 82 degrees F)

*Organic matter content:* 0 to 0.5 percent

*Control section:*

Clay content—1 to 6 percent

Rock fragments—average of 35 to 60 percent; ranging from 15 to 75 percent in individual layers; dominantly gravel (more than half of which is 2 to 5 millimeters in size) and 0 to 15 percent cobbles or stones

*A horizon:*

Value—5 to 7 dry; 4 or 5 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—coarse sand or loamy coarse sand

Clay content—1 to 8 percent

Rock fragments—15 to 60 percent; dominantly fine gravel

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

*C or Ck horizon:*

Hue—10YR or 7.5YR

Value—5 or 6 dry; 4 or 5 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, or loamy sand

Structure—massive or single grain

Consistence—soft or loose

Rock fragments—average of 35 to 60 percent; ranging from 15 to 75 percent in individual layers; dominantly fine gravel and 0 to 15 percent cobbles or stones

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Other features—few very thin, randomly oriented calcium carbonate coats occur on rock fragments in some pedons

## Contactmine Series

The Contactmine series consists of moderately deep, well drained soils that formed in colluvium over residuum derived from granite and/or gneiss. Contactmine soils are on hills and mountains. Slopes range from 4 to 75 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (71 degrees F).

### Taxonomic Classification

Fine-loamy, mixed, superactive, thermic Typic Haplargids

### Typical Pedon

Contactmine sandy loam; San Bernardino County, California; on a linear, south-southwest-facing, 31 percent slope under desert shrubs, approximately 1.3 kilometers north-northeast of the Desertqueen Mine parking area, in Joshua Tree National Park; approximately 80 meters south and 130 meters east of the northwest corner of section 5, T. 2 S., R. 9 E., San Bernardino Base and Meridian; at an elevation of 1,419 meters; lat. 34 degrees 02 minutes 01 second N. and lat. 116 degrees 04 minutes 08 seconds W.; USGS Queen Mountain 7.5 minute topographic quadrangle; UTM 585954e 3766261n (DTM: NAD83). The surface is covered by approximately 25 percent fine gravel, 28 percent medium and coarse gravel, 10 percent cobbles, and 2 percent stones. (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 centimeters (0 to 1 inch); yellowish brown (10YR 5/4) sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable; slightly sticky and nonplastic; common very fine vesicular pores; 4 percent fine

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- gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.6); abrupt wavy boundary. (3 to 15 centimeters thick)
- A2—3 to 12 centimeters (1 to 5 inches); yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; moderate fine granular structure; soft, very friable; slightly sticky and nonplastic; common very fine and fine roots throughout; 8 percent fine gravel and 4 percent medium and coarse gravel; slightly alkaline (pH 7.4); clear wavy boundary. (0 to 10 centimeters thick)
- Bt—12 to 23 centimeters (5 to 9 inches); yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, very friable; moderately sticky and moderately plastic; few fine and common very fine and medium roots throughout; common very fine dendritic tubular pores; 15 percent faint yellowish brown (10YR 5/4) clay films on faces of peds; 4 percent fine gravel, 6 percent medium and coarse gravel, and 5 percent cobbles; very slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary. (12 to 65 centimeters thick)
- Btk1—23 to 55 centimeters (9 to 22 inches); yellowish brown (10YR 5/4) cobbly loam, dark yellowish brown (10YR 3/6) moist; moderate medium subangular blocky structure; moderately hard, friable; moderately sticky and slightly plastic; common very fine roots throughout; few very fine dendritic tubular pores; 25 percent distinct yellowish brown (10YR 5/4) clay films on faces of peds; 3 percent prominent white (10YR 8/1) calcium carbonate coats on bottoms of rock fragments; 6 percent fine gravel, 2 percent medium and coarse gravel, and 15 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.
- Btk2—55 to 67 centimeters (22 to 26 inches); yellowish brown (10YR 5/4) extremely gravelly loam, dark yellowish brown (10YR 3/6) moist; weak coarse subangular blocky structure; moderately hard, friable; slightly sticky and slightly plastic; 15 percent faint yellowish brown (10YR 5/4) clay films on rock fragments; 3 percent prominent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; 25 percent fine gravel and 50 percent medium and coarse gravel; moderately alkaline (pH 8.0); clear wavy boundary. (Combined thickness of the Btk horizons is 0 to 69 centimeters)
- Cr—67 to 150 centimeters (26 to 60 inches); fractured, weakly cemented granite bedrock; fractures are more than 10 centimeters apart; moderate excavation difficulty.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 18.5 to 22 degrees C

*Surface rock fragments:* 20 to 80 percent; including 5 to 50 percent fine gravel, 10 to 50 percent medium and coarse gravel, 10 to 20 percent cobbles, 3 to 10 percent stones, and 0 to 5 percent boulders

#### *Control section:*

Rock fragments—ranging from 10 to 75 percent; average of 15 to 30 percent

Clay content—average of 18 to 25 percent

Organic matter content—0 to 0.5 percent

Depth to argillic horizon—10 to 25 centimeters

Depth to paralithic contact—50 to 100 centimeters

#### *A or A1 horizon:*

Value—3 or 4 moist

Chroma—3 or 4 moist

Clay content—6 to 18 percent  
Rock fragments—3 to 25 percent gravel  
Reaction—neutral or slightly alkaline  
Note—some pedons are characterized by vesicular pores in this horizon

*A2 or Bw horizon (if it occurs):*

Value—4 or 5 dry  
Chroma—3 or 4 moist  
Clay content—7 to 18 percent  
Rock fragments—10 to 45 percent; including 10 to 40 percent gravel and 0 to 5 percent cobbles  
Reaction—neutral to moderately alkaline

*Bt horizon:*

Hue—10YR or 7.5YR  
Value—4 or 5 dry; 3 or 4 moist  
Chroma—4 or 6, dry or moist  
Texture of the fine-earth fraction—sandy loam, loam, sandy clay loam, or clay loam  
Clay content—ranging from 16 to 30 percent; average of 18 to 25 percent  
Rock fragments—ranging from 10 to 42 percent; average of 15 to 30 percent with 2 to 35 percent gravel and 0 to 7 percent cobbles

*Btk horizon (if it occurs):*

Chroma—4 to 6 moist  
Texture of the fine-earth fraction—sandy loam, loam, or clay loam  
Clay content—ranging from 18 to 28 percent; average of 18 to 25 percent  
Rock fragments—ranging from 15 to 75 percent; including 15 to 75 percent indurated gravel and 0 to 10 percent paragravel  
Reaction—slightly alkaline or moderately alkaline

*Cr horizon:*

Cementation—very weakly to moderately cemented

In map unit 1242, the Contactmine soils are considered a taxadjunct to the series. These soils are warmer (in a hyperthermic temperature regime) than the Contactmine series. This difference, however, does not affect the use and management of the soils.

## Coppermine Series

The Coppermine series consists of shallow and very shallow, well drained soils that formed in colluvium and residuum derived from granitoid and/or gneissic rock. Coppermine soils are on pediments and hills. Slopes range from 8 to 30 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, thermic Lithic Haplargids

### Typical Pedon

Coppermine sandy loam; San Bernardino County, California; approximately 2.4 kilometers (1.5 miles) north of Route 62, Twentynine Palms Highway in the town of Joshua Tree, California, approximately 730 meters south and 435 meters west of the northeast corner of section 22, T. 1 N., R. 6 E., San Bernardino Base and Meridian; lat. 34 degrees 09 minutes 26.6 seconds N. and long. 116 degrees 20 minutes 22 seconds W.; USGS Joshua Tree North, CA 7.5 minute topographic quadrangle; UTM



11S 560889e 3779804n (DTM: NAD83). The surface is covered by approximately 20 percent fine gravel, 40 percent medium and coarse gravel, 10 percent cobbles, and 8 percent stones. (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 centimeters (0 to 1 inch); yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; moderate thick platy structure; slightly hard, very friable; slightly sticky and slightly plastic; common very fine roots throughout; common medium irregular, common very fine and fine interstitial, and few medium tubular pores; 8 percent fine gravel, 2 percent medium and coarse gravel, and 3 percent cobbles; neutral (pH 7.2); clear smooth boundary.

A2—3 to 11 centimeters (1 to 4 inches); yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, very friable; slightly sticky and slightly plastic; common fine and very fine and few medium roots throughout; common medium irregular and few medium tubular pores; 13 percent fine gravel and 7 percent medium and coarse gravel; slightly alkaline (pH 7.5); clear wavy boundary. (Combined thickness of A horizons is 2 to 11 centimeters)

Bt1—11 to 20 centimeters (4 to 8 inches); yellowish brown (10YR 5/6) very gravelly sandy loam, dark yellowish brown (10YR 3/6) moist; moderate fine and medium subangular blocky structure; slightly hard, friable; slightly sticky and slightly plastic; common fine and very fine roots throughout; common fine irregular, few medium tubular, and common very fine interstitial pores; 60 percent distinct strong brown (7.5YR 4/6), dry, clay films on rock fragments and 5 percent faint strong brown (7.5YR 4/6), dry, clay films on faces of peds; 15 percent fine gravel, 5 percent weakly cemented medium and coarse paragravel, and 20 percent medium and coarse gravel; slightly alkaline (pH 7.5); clear wavy boundary.

Bt2—20 to 27 centimeters (8 to 11 inches); strong brown (7.5YR 5/6) extremely gravelly sandy clay loam, strong brown (7.5YR 4/6) moist; moderate fine and medium subangular blocky structure; moderately hard, friable; moderately sticky and moderately plastic; common very fine and few fine roots throughout; common fine irregular, common very fine interstitial, and few fine interstitial pores; 75 percent distinct strong brown (7.5YR 4/6), dry, clay films on rock fragments and 20 percent faint strong brown (7.5YR 4/6), dry, clay films on faces of peds; 30 percent fine gravel, 10 percent weakly cemented medium and coarse paragravel, and 30 percent medium and coarse gravel; slightly alkaline (pH 7.5); clear wavy boundary. (Combined thickness of Bt horizons is 9 to 29 centimeters)

Rt—27 to 37 centimeters (11 to 15 inches); very slightly weathered, fractured, very strongly cemented granitoid bedrock with high excavation difficulty and fractures 15 to 20 centimeters apart; few very fine roots matted at the top of horizon; 50 percent distinct strong brown (7.5YR 4/6), dry, clay films on rock surfaces.

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days, cumulative, between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 60 to 80 percent; including 5 to 20 percent fine gravel, 20 to 45 percent medium and coarse gravel, 5 to 30 percent cobbles, and 0 to 15 percent stones

*Note:* Some pedons have 1 to 5 percent visible secondary carbonates as fine to medium masses in the matrix but do not contain enough calcium carbonate to qualify as a calcic horizon

*Control section:*

Rock fragments—average of 35 to 50 percent; including 13 to 65 percent gravel and 0 to 25 percent cobbles  
Clay content—average of 12 to 18 percent; ranging from 4 to 22 percent  
Organic matter—0 to 0.5 percent  
Depth to the upper boundary of an argillic horizon—3 to 12 centimeters (1 to 5 inches)  
Depth to a lithic contact—14 to 36 centimeters (5.5 to 14 inches)

*A horizon:*

Value—5 or 6 dry; 3 to 5 moist  
Chroma: 3 or 4, dry or moist  
Texture of the fine-earth fraction—loamy sand, sandy loam, or fine sandy loam  
Clay content—4 to 12 percent  
Rock fragments—5 to 35 percent; predominantly fine gravel  
Effervescence—noneffervescent to strongly effervescent  
Reaction—neutral to moderately alkaline

*AB horizon (if it occurs):*

Value—5 or 6 dry; 3 to 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—loamy sand or sandy loam  
Clay content—5 to 12 percent  
Rock fragments—25 to 40 percent; predominantly medium and coarse gravel with 0 to 10 percent paragravel  
Effervescence—noneffervescent to strongly effervescent  
Reaction—neutral to moderately alkaline

*Bt or Btk horizon:*

Hue—7.5YR or 10YR  
Value—4 to 6 dry; 3 to 5 moist  
Chroma—4 to 6, dry or moist  
Texture of the fine-earth fraction—sandy loam, loam, or sandy clay loam  
Clay content—average of 12 to 18 percent; ranging from 12 to 22 percent  
Rock fragments—average of 35 to 50 percent gravel; ranging from 13 to 70 percent with 0 to 15 percent paragravel and 0 to 5 percent cobbles  
Effervescence—noneffervescent to strongly effervescent  
Reaction—neutral or slightly alkaline

## **Corbilt Series**

The Corbilt series consists of deep, somewhat excessively drained soils that formed in mixed alluvium. Corbilt soils are on fan aprons over fan remnants. Slopes range from 2 to 8 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### **Taxonomic Classification**

Coarse-loamy, mixed, superactive, thermic Duric Haplocalcids

### **Typical Pedon**

Minhyot-Corbilt association, 2 to 8 percent slopes; San Bernardino County, California; 550 meters south and 840 meters west of the northeast corner of section 11, T. 5 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 972 meters (3,188 feet); lat. 33 degrees 45 minutes 13 seconds N. and long. 115 degrees 48 minutes 32 seconds W.; USGS Porcupine Wash, California 7.5 minute topographic quadrangle;

UTM 11S 610323e 3735460n (DTM: NAD83). The surface is covered by 5 percent fine gravel and 15 percent strongly cemented gravel-sized durinodes. (Colors are for dry soil unless otherwise noted.)

- Cq1—0 to 15 centimeters (0 to 6 inches); pale brown (10YR 6/3) sand, brown (10YR 5/3) moist; single grain; loose; nonsticky and nonplastic; common very fine and fine roots throughout; 3 percent medium distinct irregular moderately cemented very pale brown (10YR 8/2), dry, durinodes with clear boundaries in matrix and 5 percent faint very pale brown (10YR 7/3), dry, silica on nodules; 6 percent fine gravel and 1 percent medium and coarse gravel; slightly effervescent; slightly alkaline (7.8); clear smooth boundary.
- Cq2—15 to 35 centimeters (6 to 14 inches); pale brown (10YR 6/3) sand, brown (10YR 5/3) moist; massive; slightly hard, very friable; nonsticky and nonplastic; common very fine, fine, and medium roots throughout; 1 percent medium distinct irregular moderately cemented very pale brown (10YR 8/2), dry, durinodes with clear boundaries in matrix and 5 percent faint very pale brown (10YR 7/3), dry, silica on nodules; 6 percent fine gravel and 1 percent medium and coarse gravel; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.
- 2Bkq—35 to 130 centimeters (14 to 51 inches); pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; common fine and medium roots; common fine and medium irregular pores; 3 percent medium distinct irregular moderately cemented very pale brown (10YR 8/2), dry, durinodes with clear boundaries in matrix and 20 percent faint very pale brown (10YR 7/3), dry, silica on nodules; 3 percent fine gravel and 2 medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.0); abrupt broken boundary.
- 2Bkqm—130 to 150 centimeters (51 to 55 inches); light gray (10YR 7/2) cemented loamy sand, brown (10YR 5/3) moist; massive; extremely hard, slightly rigid, moderately cemented; nonsticky and nonplastic; 20 percent faint very pale brown (10YR 7/3), dry, silica on nodules; 5 percent fine gravel and 2 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.1).

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 20 to 57 percent; including 5 to 55 percent gravel, 0 to 2 percent cobbles, and 0 to 15 percent strongly cemented gravel-sized durinodes

#### *Control section:*

Rock fragments—2 to 20 percent gravel

Clay content—7 to 10 percent

Depth to calcic horizon—35 to 120 centimeters (14 to 47 inches)

Depth to duripan—100 to 155 centimeters (39 to 61 inches)

#### *Cq1 horizon:*

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 or 4 dry

Clay content—1 to 4 percent

Rock fragments—2 to 20 percent gravel

Effervescence—noneffervescent to slightly effervescent

#### *Cq2 horizon:*

Value—5 or 6 dry; 4 or 5 moist

Texture of the fine-earth fraction—sand or loamy sand  
Clay content—1 to 7 percent  
Rock fragments—5 to 20 percent gravel

*2Bkq horizon:*

Value—5 or 6 dry; 4 or 5 moist  
Chroma—3 or 4, dry or moist  
Clay content—7 to 13 percent  
Rock fragments—5 to 15 percent gravel  
Effervescence—strongly or violently effervescent  
Calcium carbonate equivalent—5 to 10 percent

## Coxpin Series

The Coxpin series consists of shallow, somewhat excessively drained soils that formed in alluvium from igneous rocks. Coxpin soils are on fan remnants and fan aprons over fan remnants. Slopes range from 2 to 8 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Sandy, mixed, hyperthermic, shallow Cambidic Haplodurids

### Typical Pedon

Coxpin loamy fine sand; Riverside County, California; on an east-northeast-facing, convex, 3 percent slope under sparse desert shrubs, approximately 16.7 kilometers north-northwest of the junction of Highway 177 and MWD Aqueduct Road; 635 meters (2,083 feet) north and 228 meters (748 feet) east of the southwest corner of section 16, T. 3 S., R. 15 E., San Bernardino Base and Meridian; at an elevation of 329 meters (1,079 feet); lat. 33 degrees 54 minutes 33.2 seconds N. and long. 115 degrees 25 minutes 15.8 seconds W.; USGS Pinto Wells 7.5 minute topographic quadrangle; UTM 11S 0645974e 3753213n (DTM: NAD83). The surface is covered by approximately 15 percent fine gravel, 45 percent medium and coarse gravel, and 5 percent cobbles. (When described, the soil was dry throughout.)

A—0 to 3 centimeters (0 to 1 inch); light brown (7.5YR 6/4) loamy fine sand, yellowish brown (10YR 5/4) moist; weak medium platy structure parting to moderate fine subangular blocky; slightly hard, very friable; nonsticky and nonplastic; very few very fine roots; few very fine, fine, medium, and coarse vesicular pores; 8 percent fine gravel and 2 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (2 to 6 centimeters thick)

Bw—3 to 26 centimeters (1 to 10 inches); strong brown (7.5YR 5/6) gravelly sandy loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable; nonsticky and nonplastic; very few very fine roots; 10 percent fine gravel and 5 percent medium and coarse gravel; very slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk—26 to 42 centimeters (10 to 16 inches); yellowish brown (10YR 5/6) gravelly loamy sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable; nonsticky and nonplastic; 2 percent fine gravel; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (Combined thickness of the Bw and Bk horizons is 10 to 47 centimeters)

Bkq—42 to 56 centimeters (16 to 22 inches); very pale brown (10YR 8/2) weakly cemented sand, very pale brown (10YR 8/3) moist; duripan with 60 percent cementation; massive; hard, firm, brittle; nonsticky and nonplastic; violently effervescent; gradual wavy boundary. (11 to 67 centimeters thick)

Ck—56 to 150 centimeters (22 to 59 inches); very pale brown (10YR 7/3) sand, pale brown (10YR 6/3) moist; massive; loose; nonsticky and nonplastic; 5 percent fine gravel and 3 percent medium and coarse gravel; violently effervescent; strongly alkaline (pH 8.5).

**Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 45 to 90 percent; including 15 to 45 percent fine gravel, 15 to 50 percent medium and coarse gravel, 0 to 15 percent cobbles, and 0 to 2 percent stones

*Other characteristics:* Some pedons have a C horizon (rock layer) above the A horizon that has 80 to 90 percent rock fragments (dominantly fine gravel) and is 1 to 3 centimeters thick

*Control section:*

Depth to the upper boundary of a duripan—36 to 50 centimeters (14 to 20 inches)

Rock fragments—average of 2 to 30 percent gravel

Clay content—1 to 8 percent

Organic matter content—0 to 0.25 percent

*A horizon:*

Hue—7.5YR or 10YR

Value—5 to 7 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—fine sand, loamy fine sand, fine sandy loam, or sandy loam

Clay content—2 to 12 percent

Rock fragments—4 to 14 percent gravel

Effervescence—slightly to violently effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline to strongly alkaline

Other features—some A horizons are characterized by vesicular pores

*Bk or Bw horizon:*

Hue—7.5YR or 10YR

Value—5 to 8 dry; 4 to 7 moist

Chroma—2 to 6 dry; 3 to 6 moist

Texture of the fine-earth fraction—sand, fine sand, loamy sand, loamy fine sand, fine sandy loam, or sandy loam

Clay content—2 to 12 percent

Rock fragments—1 to 35 percent; including 1 to 15 percent gravel in the upper part of horizon and 10 to 35 percent in the lower part

Effervescence—very slightly to violently effervescent

Calcium carbonate equivalent—0 to 15 percent

Salinity—0 to 4 dS/m

Reaction—moderately alkaline to very strongly alkaline

*Bkq(m) horizon:*

Hue—7.5YR, 10YR, or 2.5Y

Value—6 to 8 dry; 5 to 7 moist

Chroma—3 or 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—sand or loamy sand



Clay content—1 to 6 percent  
Rock fragments—1 to 30 percent gravel  
Effervescence—strongly or violently effervescent  
Calcium carbonate equivalent—1 to 15 percent  
Salinity—0 to 4 dS/m  
Reaction—moderately alkaline to very strongly alkaline  
Cementation—weak to strong with 60 to 90 percent continuity

*Ck or Ckq horizon:*

Hue—7.5YR, 10YR, or 2.5Y  
Value—6 to 8 dry; 5 or 6 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—sand or fine sandy loam  
Clay content—1 to 6 percent  
Rock fragments—1 to 35 percent; including 1 to 35 percent gravel and 0 to 5 percent cobbles  
Effervescence—slightly to violently effervescent  
Calcium carbonate equivalent—0 to 5 percent  
Salinity—0 to 4 dS/m  
Reaction—moderately alkaline to very strongly alkaline

## Crackerjack Series

The Crackerjack series consists of shallow, well drained soils that formed in mixed alluvium on fan remnants and ballenas. Slopes range from 2 to 30 percent. The mean annual precipitation is about 5 inches, and the mean annual air temperature is about 66 degrees F.

### Taxonomic Classification

Loamy, mixed, superactive, thermic, shallow Cambidic Haplodurids

### Typical Pedon

Tenwell-Crackerjack association, 2 to 15 percent slopes; San Bernardino County, California, about 155 kilometers north of the survey area within Fort Irwin Military Reservation; about 7.75 miles (12.5 kilometers) north and 2.5 miles (4 kilometers) west of the Fort Irwin cantonment, in an unsectionalized area; at an elevation of about 3,325 feet; lat. 35 degrees 22 minutes 31 seconds N. and long. 116 degrees 43 minutes 48 seconds W.; USGS West of Drinkwater Lake 7.5 minute topographic quadrangle; UTM 11S 0524500e 3914478n (DTM: NAS-C). The surface is covered by approximately 80 percent gravel and 5 percent cobbles. (Colors are for dry soil unless otherwise noted.)

A1—0 to 1 inch; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; moderate thick platy structure; soft, very friable; nonsticky and nonplastic; common very fine and fine roots; common fine interstitial and few fine vesicular pores; strongly effervescent; 70 percent gravel and 3 percent cobbles; moderately alkaline (pH 8.1); clear wavy boundary.

A2—1 to 7 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine, fine, and medium roots; many fine interstitial pores; strongly effervescent; 25 percent gravel and 1 percent cobbles; moderately alkaline (pH 8.1); clear wavy boundary. (Combined thickness of the A horizons is 1 to 8 inches)

Bkq—7 to 13 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; massive parting to weak coarse subangular blocky structure; soft, very friable; nonsticky and slightly plastic; few very fine and

## Soil Survey of Joshua Tree National Park, California

common fine and medium roots; common fine interstitial pores; 10 percent durinodes as broken duripan fragments; violently effervescent; 25 percent gravel and 2 percent cobbles; moderately alkaline (pH 8.1); abrupt wavy boundary. (5 to 10 inches thick)

Bkqm—13 to 16 inches; very pale brown (10YR 8/3) moderately cemented duripan with broken, discontinuous laminar cap 2 millimeters thick, very pale brown (10YR 7/4) moist; very hard, very firm, brittle; few fine and medium roots in fractures; gradual wavy boundary. (3 to 24 inches thick)

Ckq1—16 to 31 inches; very pale brown (10YR 7/3) very cobbly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; moderately hard to very hard, friable to very firm; nonsticky and nonplastic; few fine and medium widely spaced roots; 25 percent moderately to strongly cemented durinodes as multiple broken layers; 10 percent carbonates as bands associated with durinodes; slightly effervescent; 25 percent gravel and 10 percent cobbles; moderately alkaline (pH 8.3); gradual wavy boundary.

Ckq2—31 to 65 inches; very pale brown (10YR 7/4) very gravelly loamy sand, yellowish brown (10YR 5/4) moist; massive; hard, friable; nonsticky and nonplastic; 10 percent moderately to strongly cemented durinodes as multiple broken layers; 5 percent carbonates as bands associated with durinodes; strongly effervescent; 40 percent gravel and 15 percent cobbles; moderately alkaline (pH 8.3).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and October following convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 63 to 72 degrees F

*Surface rock fragments:* 20 to 85 percent gravel; including 0 to 25 percent cobbles and 0 to 3 percent stones

#### *Control section:*

Rock fragments—25 to 35 percent; dominantly gravel

Clay content—ranging from 8 to 15 percent

Depth to duripan—10 to 14 inches

Organic matter content—0 to 0.5 percent

Reaction—slightly alkaline or moderately alkaline

#### *A horizon:*

Value—5 to 7 dry; 3 to 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sandy loam or loam

Clay content—8 to 15 percent

Rock fragments—65 to 85 percent in the upper part of horizon and 20 to 35 percent in the lower part; including 10 to 70 percent gravel, 1 to 25 percent cobbles, and 0 to 2 percent stones

Consistence—soft or slightly hard

Effervescence—slight to violent

#### *Bkq horizon:*

Value—6 or 7 dry; 4 or 5 moist

Chroma—3 or 4 dry

Texture of the fine-earth fraction—sandy loam or loam

Clay content—10 to 15 percent

Rock fragments—25 to 35 percent; including 25 to 35 percent gravel and 0 to 2 percent cobbles

Durinodes—5 to 40 percent

*Bkqm horizon:*

Value—7 or 8 moist

Chroma—1 to 3 dry; 3 or 4 moist

Consistence—hard or very hard and firm or very firm

Cementation—moderately or strongly cemented

*Ckq horizon:*

Value—6 or 7 dry; 4 or 5 moist

Clay content—2 to 8 percent

Rock fragments—35 to 60 percent; including 25 to 45 percent gravel and 10 to 20 percent cobbles

Durinodes—10 to 45 percent

## **Cronese Series**

The Cronese series consists of very deep, well drained soils that formed in mixed alluvium. Cronese soils are on alluvial fans, fan aprons, and fan remnants. Slopes range from 2 to 15 percent. The mean annual precipitation is about 5 inches, and the mean annual air temperature is about 66 degrees F.

### **Taxonomic Classification**

Coarse-loamy, mixed, superactive, thermic Typic Haplocalcids

### **Typical Pedon**

Coyote-Cronese complex, 2 to 30 percent slopes; San Bernardino County, California, about 130 kilometers north of the survey area within Fort Irwin Military Reservation; about 1,400 feet east and 1,300 feet north of the southwest corner of section 11, T. 12 N., R. 2 E.; at an elevation of 2,320 feet; lat. 35 degrees 08 minutes 37 seconds N. and long. 116 degrees 44 minutes 39 seconds W.; USGS Langford Well 7.5 minute topographic quadrangle; UTM 11S 0523376e 3888821n. The surface is covered by 40 percent gravel. (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 inches; light yellowish brown (10YR 6/4) gravelly loamy coarse sand, pale brown (10YR 6/3) moist; weak thin platy structure; soft, loose; nonsticky and nonplastic; many very fine and few fine roots throughout; few fine vesicular pores throughout; strongly effervescent (calcium carbonate equivalent of 1 percent); 30 percent gravel; moderately alkaline (pH 8.0); abrupt smooth boundary.

A2—3 to 14 inches; very pale brown (10YR 7/3) coarse sandy loam, pale brown (10YR 6/3) moist; moderate medium granular structure; slightly hard, friable; slightly sticky and slightly plastic; common very fine, fine, and medium roots throughout; strongly effervescent (calcium carbonate equivalent of 1 percent); 10 percent gravel; moderately alkaline (pH 8.2); clear wavy boundary. (Combined thickness of the A horizons is 2 to 14 inches)

BAk—14 to 20 inches; very pale brown (10YR 7/3) coarse sandy loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure parting to weak medium granular; moderately hard, friable; slightly sticky and slightly plastic; few very fine, fine, and medium roots throughout; disseminated carbonates throughout; violently effervescent (calcium carbonate equivalent of 7 percent); 5 percent gravel; moderately alkaline (pH 8.3); gradual wavy boundary. (0 to 6 inches thick)

Bkq—20 to 40 inches; very pale brown (10YR 7/3) coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; very hard, friable; nonsticky and nonplastic; few very fine, fine, and medium roots throughout; common distinct fine and medium irregular carbonate concretions and common medium distinct irregular durinodes throughout; few thin (0.5 to 1.0

inch) brittle discontinuous strata that are weakly cemented by calcium carbonate; common fine threads and irregular masses of carbonates throughout; violently effervescent (calcium carbonate equivalent of 7 percent); 5 percent gravel; strongly alkaline (pH 8.6); clear wavy boundary.

Ck—40 to 70 inches; very pale brown (10YR 7/3) loamy coarse sand, dark yellowish brown (10YR 4/4) moist; massive; very hard, friable; nonsticky and nonplastic; common very fine and fine and few medium roots throughout; common fine threads and irregular masses of carbonates throughout; violently effervescent (calcium carbonate equivalent of 7 percent); 11 percent gravel; strongly alkaline (pH 8.9); gradual wavy boundary. (Combined thickness of the Bkq and Ck horizons is 15 to 70 inches)

2Btk—70 to 80 inches; very pale brown (10YR 7/3) gravelly coarse sandy loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, friable; nonsticky and nonplastic; few very fine, fine, and medium roots throughout; few thin patchy clay films bridging mineral grains and in pores; common fine threads and few fine irregular masses of carbonates throughout; violently effervescent (calcium carbonate equivalent of 10 percent); 20 percent gravel; strongly alkaline (pH 9.0).

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and October following convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 63 to 72 degrees F

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 15 to 75 percent gravel, 0 to 15 percent cobbles, and 0 to 5 percent stones

#### *Control section:*

Clay content—average of 8 to 18 percent

Texture of the fine-earth fraction—coarse sandy loam or sandy loam

Rock fragments—average of 5 to 30 percent; mainly gravel

Calcium carbonate equivalent—5 to 10 percent

Durinodes—0 to 15 percent

#### *A horizon:*

Hue—2.5Y or 10YR

Value—6 or 7 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy coarse sand, loamy sand, or coarse sandy loam

Clay content—5 to 15 percent

Rock fragments—10 to 60 percent; including 10 to 60 percent gravel and 0 to 10 percent cobbles and stones

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline or moderately alkaline

#### *Bk or Bqk horizon:*

Hue—2.5Y or 10YR

Value—6 or 7 dry; 5 or 6 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—coarse sandy loam or sandy loam

Clay content—10 to 18 percent

Rock fragments—5 to 35 percent; mainly gravel

Calcium carbonate equivalent—5 to 20 percent

Reaction—moderately alkaline or strongly alkaline

*Ck horizon:*

Hue—2.5Y or 10YR  
Value—6 or 7 dry; 4 or 6 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—loamy coarse sand or loamy sand  
Clay content—5 to 10 percent  
Rock fragments—5 to 15 percent; mainly gravel  
Calcium carbonate equivalent—5 to 20 percent  
Reaction—moderately alkaline or strongly alkaline

*2Btk horizon (if it occurs):*

Hue—2.5Y or 10YR  
Value—6 or 7 dry; 5 to 7 moist  
Chroma—3 or 4, dry or moist  
Clay content—15 to 18 percent  
Rock fragments—10 to 35 percent gravel  
Calcium carbonate equivalent—5 to 20 percent  
Reaction—moderately alkaline or strongly alkaline

## Crosgrain Series

The Crosgrain series consists of well drained soils that are very shallow and shallow to a duripan and that formed in mixed alluvium. Crosgrain soils are on partial ballenas, ballenas, and fan remnants. Slopes range from 2 to 50 percent. The mean annual precipitation is about 6 inches, and the mean annual air temperature is about 68 degrees F.

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, thermic, shallow Typic Haplodurids

### Typical Pedon

Crosgrain extremely gravelly loam, rangeland and wildlife habitat; Clark County, Nevada; approximately 6.5 miles (10.5 kilometers) southwest of Keyhole Canyon archaeological site; about 1,730 feet south and 1,770 feet west of the northeast corner of section 36, T. 26 S., R. 62 E.; lat. 35 degrees 38 minutes 36 seconds N. and long. 114 degrees 59 minutes 47 seconds W.; USGS Keyhole Canyon, Nevada 7.5 minute topographic quadrangle; UTM 11s 681401e 3946240n (DTM: NAD83). The surface is covered by approximately 84 percent pebbles, 10 percent cobbles, and 1 percent stones. (Colors are for dry soil unless otherwise noted.)

A—0 to 1 inch; light brownish gray (10YR 6/2) extremely gravelly loam, dark grayish brown (10YR 4/2) moist; weak thick platy structure parting to medium subangular blocky; soft, very friable; slightly sticky and slightly plastic; few very fine roots; few very fine tubular and interstitial pores; 74 percent pebbles, 5 percent cobbles, and 1 percent stones; violently effervescent (7 percent calcium carbonate equivalent in the fine-earth fraction); moderately alkaline (pH 8.2); abrupt smooth boundary. (1 to 3 inches thick)

Bw—1 to 5 inches; very pale brown (10YR 7/3) very gravelly loam, pale brown (10YR 6/3) moist; moderate medium subangular blocky structure; soft, very friable; slightly sticky and slightly plastic; many very fine and few medium roots; many very fine and few fine tubular pores; 40 percent pebbles and 3 percent cobbles; violently effervescent (12 percent calcium carbonate equivalent in the fine-earth fraction); moderately alkaline (pH 8.4); clear wavy boundary.

Bk—5 to 11 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable; slightly sticky



and slightly plastic; many very fine and few fine and medium roots; common very fine and few fine tubular pores; few distinct calcium carbonate coats on undersides of rock fragments in lower part of the horizon; 40 percent pebbles, 3 percent cobbles, and 1 percent stones; violently effervescent (12 percent calcium carbonate equivalent in the fine-earth fraction); strongly alkaline (pH 8.6); abrupt wavy boundary. (Combined thickness of the B horizons is 5 to 13 inches)

Bqkm1—11 to 24 inches; very pale brown (10YR 8/2) indurated duripan, light gray (10YR 7/2) moist; massive; very rigid, brittle; violently effervescent; abrupt smooth boundary. (10 to 15 inches thick)

Bqkm2—24 to 49 inches; pink (7.5YR 8/4) strongly cemented duripan, reddish yellow (7.5YR 6/6) moist; massive; extremely hard, slightly rigid, brittle; discontinuous lenses of extremely gravelly sand (2 to 6 inches thick); massive; soft, very friable; nonsticky and nonplastic; few very fine roots; violently effervescent (13 percent calcium carbonate equivalent in the fine-earth fraction); strongly alkaline (pH 8.8); abrupt smooth boundary. (20 to 30 inches thick)

Bqm—49 to 60 inches; brown (7.5YR 4/4) weakly cemented duripan, dark brown (7.5YR 3/4) moist; massive; hard, very firm, brittle; discontinuous lenses of extremely gravelly sand (2 to 6 inches thick); massive; soft, very friable; nonsticky and nonplastic; few very fine roots; moderately alkaline (pH 8.4).

#### **Range in Characteristics**

*Soil moisture:* Usually dry; moist in some part during winter and spring and intermittently moist in the upper part of the profile following summer thunderstorms; the soils have a typic-aridic moisture regime

*Soil temperature:* 63 to 72 degrees F

*Depth to duripan:* 6 to 14 inches

#### *Control section:*

Clay content—8 to 20 percent

Rock fragments—average of 40 to 70 percent

#### *A horizon:*

Value—6 or 7 dry; 4 to 6 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—sandy loam or loam

#### *Bw or Bk horizon:*

Value—5 to 7 dry; 4 to 6 moist

Chroma—3 or 4, dry or moist

Texture—sandy loam or loam

Rock fragments—35 to 70 percent

#### *Bqkm or Bqm horizon:*

Hue—10YR or 7.5YR

Value—6 or 7 moist

Chroma—1 to 6, dry or moist

Other features—some horizons do not have the 2- to 6-inch-thick discontinuous layers of extremely gravelly sand

## **Dalelake Series**

The Dalelake series consists of very deep, somewhat excessively drained soils that formed in eolian material from mixed sources. Dalelake soils are on dunes, coppice dunes, and sand sheets. Slopes range from 0 to 30 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### **Taxonomic Classification**

Mixed, hyperthermic Typic Torripsamments

#### **Typical Pedon**

Dalelake fine sand; San Bernardino County, California; on a north-northwest-facing, convex, 8 percent slope under desert shrubs and grasses, approximately 4 kilometers southeast of the junction of Highway 62 and Iron Age Road; 1,175 meters (3,855 feet) south and 1,443 meters (4,734 feet) east of the southeast corner of section 12, T. 1 S., R. 12 E., San Bernardino Base and Meridian; at an elevation of 535 meters (1,755 feet); lat. 34 degrees 4 minutes 53.8 seconds N. and long. 115 degrees 39 minutes 07.8 seconds W.; USGS New Dale, California 7.5 minute topographic quadrangle; UTM 11S 0624353e 3772025n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

- A—0 to 6 centimeters (0 to 2.5 inches); very pale brown (10YR 7/3) fine sand, pale brown (10YR 6/3) moist; weak thick platy structure; loose; nonsticky and nonplastic; few very fine roots; neutral (pH 6.8); clear wavy boundary. (3 to 7 centimeters thick)
- C1—6 to 45 centimeters (2.5 to 18 inches); very pale brown (10YR 7/3) fine sand, pale brown (10YR 6/3) moist; single grain; loose; nonsticky and nonplastic; few very fine, fine, medium, and coarse roots; slightly alkaline (pH 7.6); gradual wavy boundary.
- C2—45 to 150 centimeters (18 to 59 inches); very pale brown (10YR 7/3) fine sand, pale brown (10YR 6/3) moist; single grain; loose; nonsticky and nonplastic; few medium and coarse roots; neutral (pH 7.2). (Combined thickness of the C horizons is more than 100 centimeters)

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 0 to 60 percent; including 0 to 60 percent gravel and 0 to 5 percent cobbles

#### *Control section:*

Rock fragments—0 to 7 percent; dominantly fine gravel

Clay content—1 to 4 percent

Organic matter content—0 to 0.5 percent

#### *A horizon:*

Value—6 or 7 dry; 4 to 6 moist

Chroma—2 to 4, dry or moist

Clay content—1 to 4 percent

Rock fragments—0 to 10 percent gravel

Reaction—neutral to moderately alkaline

Electrical conductivity—0 to 2 dS/m

#### *C horizon:*

Value—6 or 7 dry; 4 to 6 moist

Chroma—3 or 4, dry or moist

Clay content—1 to 4 percent

Rock fragments—0 to 5 percent gravel

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to strongly alkaline in the upper part of horizon and moderately alkaline to very strongly alkaline in the lower part  
Electrical conductivity—0 to 2 dS/m

## Dalvord Series

The Dalvord series consists of somewhat excessively drained soils that are very shallow and shallow to bedrock and that formed in colluvium and residuum weathered from granitoid or gneissic sources. Dalvord soils are on mountains, hills, and pediments. Slopes range from 8 to 75 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is about 16.5 degrees C (61.5 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Torriorthents

### Typical Pedon

Dalvord extremely stony sandy loam; San Bernardino County, California, about 125 kilometers north of the survey area near the southern boundary of Fort Irwin Military Reservation; on a west-northwest-facing, linear, 32 percent slope under desert shrubs; about 396 meters (1,300 feet) west and 450 meters (1,476 feet) south of the northeast corner of section 2, T. 12 N., R. 2 E., San Bernardino Base and Meridian; at an elevation of 833 meters (2,732 feet); lat. 35 degrees 10 minutes 01 second N. and long. 116 degrees 44 minutes 08 seconds W.; USGS Langford Well, California 7.5 minute topographic quadrangle; UTM 11S 0524120e 3891391n (DTM: NAD83). The soil surface is covered with approximately 10 percent gravel, 10 percent cobbles, and 45 percent stones and boulders. (Colors are for dry soil unless otherwise noted.)

- A1—0 to 2 centimeters (0 to 1 inch); pale brown (10YR 6/3) extremely stony sandy loam, brown (10YR 5/3) moist; weak thin platy structure parting to weak fine subangular blocky; soft, very friable; slightly sticky and slightly plastic; few very fine roots throughout; common tubular pores throughout; 35 percent gravel, 10 percent cobbles, and 20 percent stones and boulders; violently effervescent (calcium carbonate equivalent of 1 percent); moderately alkaline (pH 8.2); abrupt wavy boundary.
- A2—2 to 15 centimeters (1 to 6 inches); very pale brown (10YR 7/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure parting to moderate medium granular; soft, very friable; slightly sticky and slightly plastic; few very fine roots in cracks; few fine tubular pores throughout; 35 percent gravel and 5 percent cobbles; violently effervescent (calcium carbonate equivalent of 5 percent); moderately alkaline (pH 8.3); abrupt smooth boundary. (Combined thickness of the A horizons is 2 to 35 centimeters)
- R—15 to 152 centimeters (6 to 60 inches); unweathered, fractured granitoid bedrock; pockets of weathered bedrock material with moderate to high excavation difficulty.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 15 to 22 degrees C (59 to 72 degrees F)

*Surface rock fragments:* 60 to 95 percent; including 5 to 85 percent gravel, 0 to 25 percent cobbles, and 0 to 50 percent stones

*Control section:*

Organic matter content—0 to 0.5 percent  
Clay content—5 to 15 percent  
Rock fragments—average of 40 to 85 percent; including 40 to 85 percent gravel, 0 to 40 percent cobbles, and 0 to 30 percent stones  
Depth to bedrock—8 to 36 centimeters (3 to 14 inches)

*C horizon (if it occurs):*

Rock fragments—80 to 95 percent; including 30 to 75 percent gravel, 13 to 20 percent cobbles, 2 to 20 percent stones, and 0 to 10 percent boulders

*A horizon:*

Hue—10YR or 2.5Y  
Value—5 to 7 dry; 3 to 6 moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—coarse sandy loam or sandy loam  
Clay content—5 to 15 percent  
Rock fragments—15 to 85 percent; including 15 to 85 percent gravel, 0 to 40 percent cobbles, and 0 to 30 percent stones  
Calcium carbonate equivalent—1 to 10 percent  
Reaction—neutral to moderately alkaline

*Bt, Bk, and C horizons (if they occur):*

Value—5 to 7 dry; 3 to 6 moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—coarse sandy loam, sandy loam, or fine sandy loam  
Clay content—5 to 15 percent  
Rock fragments—5 to 85 percent; including 5 to 85 percent gravel, 0 to 25 percent cobbles, and 0 to 30 percent stones  
Calcium carbonate equivalent—1 to 5 percent  
Reaction—neutral to moderately alkaline  
Other features—0 to 15 percent calcium carbonate coats on bottom of rock fragments and 0 to 5 percent clay films on rock fragments

## Deprave Series

The Deprave series consists of moderately deep, well drained soils that formed in alluvium from granitoid and/or gneissic rocks. Deprave soils are on fan remnants. Slopes range from 0 to 4 percent. The mean annual precipitation is about 75 millimeters (3 inches), and the mean annual air temperature is about 25 degrees C (77 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids

### Typical Pedon

Deprave gravel; Riverside County, California; on an east-facing, linear, 2 percent slope under sparse desert shrubs, approximately 840 meters (2,755 feet) north-northeast of the junction of Eagle Mountain and MWD Aqueduct Roads; 21 meters (70 feet) east and 736 meters (2,415 feet) north of the southwest corner of section 36, T. 4 S., R. 14 E., San Bernardino Base and Meridian; at an elevation of 351 meters (1,151 feet); lat. 33 degrees 46 minutes 43.4 seconds N. and long. 115 degrees 27 minutes 36.1 seconds W.; USGS Victory Pass 7.5 minute topographic quadrangle; UTM 11S 0642587e 3738685n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

## Soil Survey of Joshua Tree National Park, California

- C—0 to 4 centimeters (0 to 1.5 inches); gravel; 20 percent fine gravel, 68 percent medium and coarse gravel, 9 percent cobbles, and 1 percent stones; abrupt wavy boundary. (3 to 7 centimeters thick)
- A—4 to 10 centimeters (1.5 to 4 inches); light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; strong very thick platy structure; slightly hard, friable; slightly sticky and slightly plastic; few very fine roots; common very fine and few fine and medium vesicular pores and very few fine tubular pores; 10 percent fine gravel, 15 percent medium and coarse gravel, and 5 percent cobbles; slightly effervescent; slightly alkaline (pH 7.6); abrupt wavy boundary. (2 to 8 centimeters thick)
- Btk—10 to 39 centimeters (4 to 15 inches); yellowish red (5YR 4/6) very gravelly sandy clay loam, yellowish red (5YR 4/6) moist; weak fine subangular blocky structure; soft, very friable; slightly sticky and moderately plastic; very few very fine interstitial pores; 15 percent prominent strong brown (7.5YR 4/6) clay films on faces of peds; 1 percent fine distinct very pale brown (10YR 8/2) calcium carbonate masses on surfaces along root channels; 25 percent fine gravel, 20 percent medium and coarse gravel, 1 percent cobbles, and 1 percent stones; very slightly effervescent; slightly alkaline (pH 7.6); gradual wavy boundary. (25 to 50 centimeters thick)
- Bq1—39 to 54 centimeters (15 to 21 inches); brown (7.5YR 4/4) very gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; loose; nonsticky and nonplastic; 2 percent distinct light gray (10YR 7/2) silica coats on bottom of rock fragments; 20 percent fine gravel, 30 percent medium and coarse gravel, and 1 percent cobbles; very slightly effervescent; slightly alkaline (pH 7.8); abrupt wavy boundary.
- Bq2—54 to 98 centimeters (21 to 38.5 inches); brown (10YR 5/3) very gravelly sand, brown (10YR 4/3) moist; single grain; loose; nonsticky and nonplastic; 20 percent distinct light gray (10YR 7/2) silica coats on bottom of rock fragments and 10 percent fine distinct light gray (10YR 7/2) moderately cemented irregular silica masses on bottom of rock fragments; 5 percent medium prominent very pale brown (10YR 8/2) moderately cemented irregular durinodes in the matrix; 10 percent fine gravel, 45 percent medium and coarse gravel, and 1 percent cobbles; violently effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (0 to 65 centimeters thick)
- Bqkm1—98 to 112 centimeters (38.5 to 44 inches); light gray (10YR 7/2) very weakly cemented very gravelly sand, brown (10YR 5/3) moist; duripan with 95 percent cementation; massive; hard, firm; nonsticky and nonplastic; 75 percent distinct white (10YR 8/1) calcium carbonate coats on rock fragments; 15 percent coarse distinct light gray (10YR 7/2) moderately cemented irregular silica masses on bottom of rock fragments and 5 percent medium prominent very pale brown (10YR 8/2) moderately cemented irregular durinodes in the matrix; 15 percent fine gravel, 40 percent medium and coarse gravel, and 1 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.
- Bqkm2—112 to 136 centimeters (44 to 53 inches); pale brown (10YR 6/3) very weakly cemented gravelly sand, dark yellowish brown (10YR 4/6) moist; duripan with 95 percent cementation; massive; hard, firm; nonsticky and nonplastic; 60 percent distinct very pale brown (10YR 8/2) calcium carbonate coats on rock fragments; 10 percent fine distinct light gray (10YR 7/2) moderately cemented irregular silica masses on bottom of rock fragments and 10 percent distinct light gray (10YR 7/2) silica coats on bottom of rock fragments; 15 percent fine gravel, 10 percent medium and coarse gravel, and 1 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.
- Bqkm3—136 to 160 centimeters (53 to 63 inches); pale brown (10YR 6/3) extremely weakly cemented very gravelly coarse sand, brown (10YR 5/3) moist; duripan with 95 percent cementation; massive; very hard, firm; nonsticky and nonplastic;



## Soil Survey of Joshua Tree National Park, California

60 percent distinct very pale brown (10YR 8/2) calcium carbonate coats on rock fragments; 4 percent distinct very pale brown (10YR 7/3) silica coats on bottom of rock fragments; 20 percent fine gravel, 30 percent medium and coarse gravel, and 3 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2).

### Range in Characteristics

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some part during summer and winter; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (77 to 82 degrees F)

*Surface rock fragments:* 90 to 100 percent; including 15 to 30 percent fine gravel, 40 to 80 percent medium and coarse gravel, 5 to 35 percent cobbles, and 0 to 5 percent stones

#### *Control section:*

Rock fragments—average of 35 to 60 percent; gravel, cobbles, and stones

Clay content—average of 18 to 25 percent

Organic matter content—0 to 0.25 percent

Depth to the upper boundary of an argillic horizon—5 to 18 centimeters (2 to 7 inches)

Depth to the upper boundary of a duripan—50 to 100 centimeters (20 to 39 centimeters)

#### *C horizon:*

Rock fragments—90 to 100 percent; gravel, cobbles, and stones

#### *A horizon:*

Hue—7.5YR or 10YR

Value—6 or 7 dry; 3 or 4 moist

Chroma—3 or 4, dry or moist

Clay content—12 to 18 percent

Rock fragments—30 to 60 percent; including 20 to 35 percent gravel, 0 to 15 percent cobbles, and 0 to 5 percent stones

Effervescence—slightly to violently effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline or moderately alkaline

#### *Btk horizon:*

Hue—5YR or 7.5YR

Value—4 or 5 dry

Chroma—4 to 6 moist

Texture of the fine-earth fraction—coarse sandy loam, sandy loam, or sandy clay loam

Clay content—15 to 28 percent

Rock fragments—35 to 70 percent; including 25 to 45 percent gravel, 0 to 15 percent cobbles, and 0 to 5 percent stones

Effervescence—very slightly to strongly effervescent

Calcium carbonate equivalent—0 to 10 percent

Reaction—slightly alkaline or moderately alkaline

Visible secondary carbonates—0 to 5 percent as coats on rock fragments

#### *Bq and Bkqm horizons:*

Hue—7.5YR, 10YR, or 2.5Y

Value—4 to 8 dry; 4 to 6 moist

Chroma—2 to 6 dry; 2 to 4 moist

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, loamy sand, or sandy loam

Clay content—1 to 8 percent

Rock fragments—25 to 80 percent; including 25 to 60 percent gravel, 0 to 15 percent cobbles, and 0 to 2 percent stones  
Effervescence—very slightly to violently effervescent  
Calcium carbonate equivalent—0 to 15 percent  
Reaction—neutral to moderately alkaline  
Visible secondary carbonates—0 to 60 percent as coats on rock fragments  
Silica—0 to 5 percent as durinodes and 0 to 15 percent as masses in the matrix and 0 to 20 percent as coats on rock fragments  
Cementation—noncemented to moderately cemented matrix with 60 to 100 percent cementation

In map unit 2403, the Deprave soils are considered a taxadjunct to the series. These soils have less coarse fragments than what is typical for the Deprave series. This difference, however, does not significantly affect the use and management of the soils.

## Descent Series

The Descent series consists of very deep, somewhat excessively drained soils that formed in alluvium from granitoid and gneiss. Descent soils are on ballenas and fan remnants. Slopes range from 2 to 50 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

### Typical Pedon

Descent channery loamy fine sand; Riverside County, California; on an east-facing, linear, 37 percent slope under sparse desert shrubs, approximately 1.8 kilometers (1.1 miles) north of the junction of California Highway 177 and MWD Aqueduct Road, north of Desert Center; 110 meters (361 feet) south and 306 meters (1,003 feet) east of the northwest corner of section 22, T. 4 S., R. 16 E., San Bernardino Base and Meridian; at an elevation of 200 meters (656 feet); lat. 33 degrees 48 minutes 55.9 seconds N. and long. 115 degrees 17 minutes 42.7 seconds W.; USGS East of Victory Pass 7.5 minute topographic quadrangle; UTM 11S 0657783e 3743009n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

- C—0 to 4 centimeters (0 to 1.5 inches); channers; approximately 10 percent fine channers, 68 percent medium and coarse channers, and 7 percent flagstones; abrupt smooth boundary. (0 to 8 centimeters thick)
- Akq—4 to 5 centimeters (1.5 to 2 inches); pale brown (10YR 6/3) channery loamy fine sand, brown (10YR 5/3) moist; moderate fine subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; 5 percent fine light gray (10YR 7/2) weakly cemented durinodes within the matrix; very few very fine roots; 10 percent fine channers and 5 percent medium and coarse channers; slightly effervescent (8 percent calcium carbonate equivalent in the fine-earth fraction); moderately alkaline (pH 8.1); clear wavy boundary. (1 to 5 centimeters thick)
- Bkq1—5 to 19 centimeters (2 to 7.5 inches); pale brown (10YR 6/3) extremely channery fine sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; 3 percent fine light gray (10YR 7/2) weakly cemented durinodes within the matrix; 3 percent fine silica masses on bottom of rock fragments; few very fine and very few fine roots; 20 percent fine channers and 50 percent medium and coarse channers; violently

effervescent (10 percent calcium carbonate equivalent in the fine-earth fraction); moderately alkaline (pH 8.1); clear wavy boundary.

Bkq2—19 to 42 centimeters (7.5 to 16.5 inches); very pale brown (10YR 7/3) very channery loamy sand, pale brown (10YR 6/3) moist; massive; slightly hard, very friable; nonsticky and nonplastic; 3 percent fine silica masses on bottom of rock fragments; common very fine and few fine roots; 15 percent fine channers, 30 percent medium and coarse channers, and 5 percent flagstones; violently effervescent (13 percent calcium carbonate equivalent in the fine-earth fraction); moderately alkaline (pH 8.2); gradual wavy boundary.

Bkq3—42 to 69 centimeters (16.5 to 27 inches); pale brown (10YR 6/3) extremely channery sand, brown (10YR 5/3) moist; massive; soft, very friable; nonsticky and nonplastic; 3 percent fine silica masses on bottom of rock fragments; few very fine and very few fine roots; 10 percent fine channers and 65 percent medium and coarse channers; violently effervescent (9 percent calcium carbonate equivalent in the fine-earth fraction); moderately alkaline (pH 8.3); gradual wavy boundary.

Bkq4—69 to 152 centimeters (27 to 60 inches); very pale brown (10YR 7/3) extremely channery sand, pale brown (10YR 6/3) moist; single grain; loose; nonsticky and nonplastic; 1 percent fine silica masses on bottom of rock fragments; 40 percent fine channers, 15 percent medium and coarse channers, and 5 percent flagstones; violently effervescent (9 percent calcium carbonate equivalent in the fine-earth fraction); moderately alkaline (pH 8.3).

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 80 to 100 percent; including 10 to 25 percent fine channers, 45 to 70 percent medium and coarse channers, 0 to 25 percent flagstones, 0 to 5 percent stones, and 0 to 1 percent boulders

#### *Control section:*

Rock fragments—average of 40 to 70 percent

Clay content—ranging from 1 to 8 percent; average of 2 to 6 percent

Calcium carbonate equivalent—5 to 16 percent

Organic matter content—0 to 0.25 percent

#### *C horizon (if it occurs):*

Rock fragments—80 to 100 percent; channers, flagstones, stones, and boulders

#### *Akq horizon:*

Value—6 to 8 dry; 4 to 7 moist

Chroma—3 or 4 dry; 2 to 6 moist

Texture of the fine-earth fraction—loamy sand, loamy fine sand, or fine sandy loam

Clay content—3 to 12 percent

Rock fragments—10 to 25 percent; including 10 to 25 percent channers and 0 to 5 percent flagstones

Calcium carbonate equivalent—1 to 10 percent

Effervescence—slightly to violently effervescent

Silica—0 to 10 percent as durinodes and 1 to 15 percent as silica films on bottom of rock fragments

#### *Bkq horizon:*

Hue—7.5YR or 10YR

Value—6 or 7 dry; 4 to 6 moist

Chroma—3 or 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—sandy loam or fine sandy loam in the upper part of horizon and sand or loamy sand in the lower part

Clay content—6 to 12 percent in the upper part and 2 to 8 percent in the lower part

Rock fragments—50 to 75 percent; including 45 to 75 percent channers, 0 to 10 percent flagstones, and 0 to 1 percent stones

Effervescence—strongly or violently effervescent

Calcium carbonate equivalent—5 to 16 percent

Reaction—moderately alkaline or strongly alkaline

Silica—0 to 10 percent as durinodes, 1 to 5 percent as silica masses, and 1 to 75 percent as silica coats on bottom of rock fragments

Note—there are no visible or identifiable secondary carbonates within Bkq horizons

## Desertqueen Series

The Desertqueen series consists of very shallow and shallow, well drained soils that formed in alluvially influenced colluvium and/or residuum derived from granite and gneissic rocks. Desertqueen soils are on pediments, hills, and mountains. Slopes range from 2 to 50 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 15 degrees C (59 degrees F).

### Taxonomic Classification

Loamy, mixed, superactive, thermic, shallow Typic Haplargids

### Typical Pedon

Desertqueen sandy loam; San Bernardino County, California; on a linear, 5 percent slope, approximately 1 kilometer south of the Live Oak parking area in Joshua Tree National Park; 260 meters north and 230 meters east of the southwest corner of section 16, T. 2 S., R. 9 E., San Bernardino Base and Meridian; an elevation of 1,290 meters (4,230 feet); lat. 33 degrees 59 minutes 32 seconds N. and long. 116 degrees 03 minutes 02 seconds W.; USGS Malapai Hill 7.5 minute topographic quadrangle; UTM 11S 587696e 3761716n (DTM: NAD83). The surface is covered by approximately 60 percent fine gravel and 25 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 4 centimeters (0 to 2 inches); yellowish brown (10YR 5/4) sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable; nonsticky and nonplastic; common very fine roots throughout; common very fine vesicular pores; 9 percent fine gravel and 3 percent medium and coarse gravel; slightly alkaline (pH 7.6); abrupt smooth boundary. (2 to 10 centimeters thick)

Bt1—4 to 13 centimeters (2 to 5 inches); dark yellowish brown (10YR 4/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, very friable; slightly sticky and slightly plastic; few fine and common very fine roots throughout; common fine interstitial pores; 8 percent distinct dark yellowish brown (10YR 4/4) clay films on faces of peds and on surfaces along pores and 2 percent faint dark yellowish brown (10YR 3/4) clay bridges between sand grains; 6 percent fine gravel and 9 percent medium and coarse gravel; slightly alkaline (pH 7.7); abrupt wavy boundary.

Bt2—13 to 30 centimeters (5 to 12 inches); yellowish brown (10YR 5/6) sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable; moderately sticky and slightly plastic; common

very fine and medium roots throughout; few very fine dendritic tubular pores; 20 percent distinct yellowish brown (10YR 5/6) clay films on faces of peds; 6 percent fine gravel and 4 percent medium and coarse gravel; slightly effervescent; slightly alkaline (pH 7.8); gradual wavy boundary. (Combined thickness of the Bt horizons is 8 to 26 centimeters)

**BCt**—30 to 36 centimeters (12 to 14 inches); yellowish brown (10YR 5/6) extremely gravelly loamy coarse sand, dark yellowish brown (10YR 4/6) moist; massive; slightly hard, very friable; slightly sticky and nonplastic; 20 percent distinct yellowish brown (10YR 5/6), dry, clay films on faces of peds; 65 percent fine gravel and 10 percent medium and coarse gravel; slightly acid (pH 6.3); clear wavy boundary. (0 to 6 centimeters thick)

**Crt**—36 to 63 centimeters (14 to 25 inches); weakly cemented, fractured, moderately weathered granite with moderate excavation difficulty; fractures are more than 10 centimeters apart; 15 percent distinct yellowish brown (10YR 5/6), dry, clay films on bedrock.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 15 to 19 degrees C

*Surface rock fragments:* 70 to 85 percent; including 15 to 60 percent fine gravel, 15 to 30 percent medium and coarse gravel, 0 to 15 percent cobbles, 0 to 12 percent stones, and 0 to 8 percent boulders

#### *Control section:*

Rock fragments—average of 5 to 35 percent; including 5 to 40 percent gravel that is predominantly 2 to 5 millimeters in size and 0 to 10 percent cobbles; some pedons contain as much as 20 percent paragravel

Clay content—10 to 18 percent

Organic matter content—0 to 0.5 percent

Depth to argillic horizon—2 to 20 centimeters

Depth to paralithic contact—10 to 36 centimeters

#### *A horizon:*

Value—4 to 6 dry; 3 or 4 moist

Chroma—3 or 4 moist

Texture of the fine-earth fraction—sand, loamy sand, or sandy loam

Clay content—2 to 10 percent

Rock fragments—5 to 25 percent; including 5 to 20 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Reaction—slightly acid to slightly alkaline

#### *Bt horizon:*

Hue—7.5YR or 10YR

Value—4 to 6 dry; 3 to 5 moist

Chroma—4 to 6, dry or moist

Texture of the fine-earth fraction—coarse sandy loam or sandy loam

Clay content—10 to 18 percent

Rock fragments—ranging from 8 to 40 percent; average of 10 to 30 percent; including 8 to 30 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly acid to slightly alkaline



## Dragonwash Series

The Dragonwash series consists of very deep, somewhat excessively drained soils that formed in alluvium from mixed igneous and metamorphic sources. Dragonwash soils are in drainageways. Slopes range from 2 to 4 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Sandy-skeletal, mixed, thermic Typic Torriorthents

### Typical Pedon

Dragonwash gravelly sand; San Bernardino County, California; on a north-northeast-facing, convex-linear, 3 percent slope under desert shrubs, approximately 7 kilometers (4.5 miles) north-northeast of the Cottonwood Visitor Center in Joshua Tree National Park; 900 meters west and 30 meters south of the northeast corner of section 25, T. 4 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 847 meters (2,780 feet); lat. 33 degrees 48 minutes 06.30 seconds N. and long. 115 degrees 46 minutes 57.6 seconds W.; USGS Porcupine Wash, California 7.5 minute topographic quadrangle; UTM 11S 0612684e 3740841n (DTM: NAD83). The surface is covered by approximately 55 percent fine gravel, 15 percent medium and coarse gravel, and 4 percent cobbles. (Colors are for dry soil unless otherwise noted.)

- A—0 to 2 centimeters (0 to 1 inch); light yellowish brown (10YR 6/4) gravelly sand, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine and fine roots; 15 percent fine gravel and 10 percent medium and coarse gravel; slightly alkaline (pH 7.8); clear smooth boundary. (2 to 12 centimeters thick)
- C1—2 to 25 centimeters (1 to 10 inches); light yellowish brown (10YR 6/4) stratified gravelly and very gravelly sand, yellowish brown (10YR 5/4) moist; single grain; loose; nonsticky and nonplastic; common very fine and few medium roots; average of 30 percent fine gravel and 10 percent medium and coarse gravel; slightly alkaline (pH 7.8); gradual smooth boundary. (23 to 87 centimeters thick)
- C2—25 to 150 centimeters (10 to 60 inches); yellowish brown (10YR 5/4) very gravelly sand, dark yellowish brown (10YR 4/4) moist; single grain; loose; nonsticky and nonplastic; common fine and medium and few coarse roots; 30 percent fine gravel and 15 percent medium and coarse gravel; very slightly effervescent; moderately alkaline (pH 8.0).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 30 to 90 percent; including 30 to 90 percent gravel and 0 to 5 percent cobbles

#### *Control section:*

Rock fragments—average of 35 to 45 percent; ranging from 5 to 60 percent gravel (more than half of which is 2 to 5 millimeters in size) and 0 to 3 percent cobbles

Clay content—1 to 3 percent

Effervescence—noneffervescent to slightly effervescent

#### *A horizon(s):*

Value—5 or 6 dry; 3 to 5 moist

Chroma—2 to 4 dry; 3 or 4 moist  
Texture of the fine-earth fraction—sand or loamy sand  
Clay content—1 to 8 percent  
Rock fragments—15 to 30 percent gravel and 0 to 2 percent cobbles

*C1 horizon:*

Value—5 or 6 dry; 3 to 5 moist  
Chroma—2 to 4 dry; 3 or 4 moist  
Clay content—1 to 3 percent  
Rock fragments—5 to 55 percent gravel and 0 to 3 percent cobbles  
Note—some pedons are stratified with gravelly sand to very gravelly sand

*C2 horizon:*

Value—7 or 8 dry; 5 or 6 moist  
Chroma—2 or 3 dry; 3 or 4 moist  
Texture of the fine-earth fraction—coarse sand or sand  
Clay content—1 to 3 percent  
Rock fragments—40 to 60 percent gravel and 0 to 3 percent cobbles  
Reaction—slightly alkaline or moderately alkaline

## Edalph Series

The Edalph series consists of very deep, well drained soils that formed in alluvium derived from granitoid rocks. Edalph soils are on fan remnants. Slopes range from 2 to 30 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Sandy, mixed, thermic Typic Haplocalcids

### Typical Pedon

Mekkadale-Edalph association, 4 to 30 percent slopes; Riverside County, California; about 450 meters west-northwest of the Cottonwood Visitor Center in Joshua Tree National Park; about 660 meters (2,165 feet) north and 525 meters (1,720 feet) east of the southwest corner of section 10, T. 5 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 940 meters (3,085 feet); lat. 33 degrees 44 minutes 58.8 seconds N. and long. 115 degrees 49 minutes 43.7 seconds W.; USGS Cottonwood Basin 7.5 minute topographic quadrangle; UTM 11S 0608475e 3735016n (DTM: NAD83). The surface is covered by approximately 5 percent fine gravel, 53 percent medium and coarse gravel, and 2 percent cobbles. (Colors are for dry soil unless otherwise noted.)

A—0 to 5 centimeters (0 to 2 inches); brown (10YR 4/3) gravelly sandy loam, yellowish brown (10YR 5/4) moist; moderate very thick platy structure; slightly hard, very friable; slightly sticky and nonplastic; few very fine and very few fine roots; few very fine and fine interstitial pores; 9 percent fine gravel and 6 percent gravel; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk1—5 to 38 centimeters (2 to 15 inches); yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable; slightly sticky and nonplastic; very few very fine and fine roots; few very fine and fine interstitial pores; 15 percent pale brown (10YR 6/3) coarse irregular very weakly cemented calcium carbonate masses in the matrix; 15 percent fine gravel and 5 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

- Bk2**—38 to 51 centimeters (15 to 20 inches); pale brown (10YR 6/3) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable; slightly sticky and nonplastic; very few very fine and fine roots; few very fine and fine interstitial pores; 30 percent white (10YR 8/1) medium irregular extremely weakly cemented calcium carbonate masses in the matrix; 50 percent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; 8 percent fine gravel and 2 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- Bkk**—51 to 79 centimeters (20 to 31 inches); very pale brown (10YR 8/2) loamy coarse sand, light yellowish brown (10YR 6/4) moist; massive; very hard, very firm; nonsticky and nonplastic; very few very fine roots; 55 percent finely disseminated calcium carbonate throughout the matrix; 10 percent fine gravel; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- Bck**—79 to 125 centimeters (31 to 49 inches); pale brown (10YR 6/3) gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; massive; hard, firm; nonsticky and nonplastic; few very fine and fine interstitial pores; 1 percent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; 18 percent fine gravel and 7 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.4).

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Control section:*

Rock fragments—average of 5 to 20 percent; ranging from 0 to 25 percent gravel  
Clay content—average of 1 to 10 percent  
Organic matter content—0 to 0.5 percent  
Depth to the upper boundary of a calcic horizon—5 to 38 centimeters (2 to 15 inches)

*A horizon:*

Value—4 to 6 dry; 3 to 5 moist  
Chroma—3 or 4, dry or moist  
Clay content—5 to 12 percent  
Rock fragments—3 to 20 percent gravel  
Effervescence—very slightly to strongly effervescent  
Calcium carbonate equivalent—1 to 5 percent  
Reaction—neutral to strongly alkaline

*Bk and Bkk horizons:*

Value—5 to 8 dry; 4 to 6 moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—loamy coarse sand or sandy loam  
Clay content—2 to 12 percent  
Rock fragments—2 to 20 percent gravel  
Consistence—slightly hard or moderately hard and very friable or friable  
Effervescence—noneffervescent to violently effervescent  
Calcium carbonate equivalent—10 to 20 percent  
Reaction—moderately alkaline or strongly alkaline  
Visible secondary carbonates—1 to 15 percent as masses or bands in the matrix and 0 to 70 percent as coats on rock fragments  
Silica—0 to 10 percent as films on bottom of rock fragments

*B<sub>Ck</sub> or C<sub>k</sub> horizon (if it occurs):*

Value—6 or 7 dry; 4 or 5 moist

Chroma—2 to 4, dry or moist

Clay content—2 to 6 percent

Rock fragments—5 to 25 percent gravel

Effervescence—noneffervescent to violently effervescent

Calcium carbonate equivalent—1 to 10 percent

Reaction—neutral to moderately alkaline

Visible secondary carbonates—0 to 5 percent as masses in the matrix and 0 to 70 percent as coats on rock fragments

## Emptygun Series

The Emptygun series consists of very deep, excessively drained soils that formed in alluvium derived from granitoid and/or gneiss. Emptygun soils are on ballenas. Slopes range from 15 to 50 percent. The mean annual precipitation is about 75 millimeters (3 inches), and the mean annual air temperature is about 24.5 degrees C (76 degrees F).

### Taxonomic Classification

Sandy-skeletal, mixed, hyperthermic Typic Haplocalcids

### Typical Pedon

Emptygun very gravelly loamy sand; Riverside County, California; on a west-southwest-facing (244 degrees), 33 percent slope, approximately 275 meters north of the Colorado River Aqueduct; 180 meters west and 545 meters south of northeast corner of section 5, T. 6 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 574 meters (about 1,880 feet); lat. 33 degrees 40 minutes 51.8 seconds N. and long. 115 degrees 51 minutes 13.8 seconds W.; USGS Cottonwood Springs, California 7.5 minute topographic quadrangle; UTM 11S 606243e 3727382n (DTM: NAD83). The surface is covered by 15 percent fine gravel, 56 percent medium and coarse gravel, 10 percent cobbles, 3 percent stones, and 1 percent boulders. (When described on October 14, 2010, the soil was dry throughout.)

A—0 to 3 centimeters (0 to 1 inch); brown (10YR 5/3) very gravelly loamy sand, dark brown (10YR 3/3) moist; moderate very thick platy structure parting to moderate medium subangular blocky; slightly hard, friable; nonsticky and nonplastic; common very fine roots; common very fine irregular pores; 16 percent fine gravel and 24 percent medium and coarse gravel; slightly alkaline (pH 7.8); clear wavy boundary.

Bk1—3 to 25 centimeters (1 to 10 inches); light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; few fine and few very fine roots; common fine and common very fine interstitial pores; 2 percent prominent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; 12 percent fine gravel, 8 percent medium and coarse gravel, and 8 percent cobbles; strongly effervescent (5 percent calcium carbonate equivalent); moderately alkaline (pH 8.0); gradual wavy boundary.

Bk2—25 to 61 centimeters (10 to 24 inches); light yellowish brown (10YR 6/4) very gravelly loamy sand, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure; slightly hard, friable; nonsticky and nonplastic; few fine and common very fine roots; common fine and common very fine interstitial pores; 2 percent prominent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; 10 percent coarse prominent irregular white (10YR 8/1) calcium carbonate masses with diffuse boundaries in matrix; 17 percent fine gravel and

18 percent medium and coarse gravel; violently effervescent (11 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); clear wavy boundary.  
Bk3—61 to 150 centimeters (24 to 59 inches); pale brown (10YR 6/3) very gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; loose; nonsticky and nonplastic; few fine and common very fine roots; 3 percent prominent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; 8 percent very coarse prominent irregular white (10YR 8/1) calcium carbonate masses with diffuse boundaries in matrix; 20 percent fine gravel, 10 percent medium and coarse gravel, and 10 percent cobbles; violently effervescent (11 percent calcium carbonate equivalent); moderately alkaline (pH 8.2).

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (77 to 82 degrees F)

#### *Control section:*

Rock fragments—35 to 70 percent; mainly gravel with 0 to 10 percent cobbles

Clay content—average of 2 to 7 percent

Depth to calcic horizon—25 to 50 centimeters

#### *A horizon:*

Value—5 or 6 dry; 3 to 5 moist

Chroma—3 or 4, dry or moist

Clay content—4 to 12 percent

Rock fragments—35 to 60 percent; mainly gravel

Calcium carbonate equivalent—0 to 10 percent

#### *Bk horizon:*

Hue—7.5YR or 10YR

Value—5 to 7 dry; 3 to 5 moist

Chroma—2 to 4 dry; 3 or 4 moist

Texture of the fine-earth fraction—loamy sand or sandy loam; averaging sandy in the particle-size control section

Clay content—2 to 7 percent

Rock fragments—35 to 70 percent; mainly gravel with 0 to 10 percent cobbles

Calcium carbonate equivalent—5 to 10 percent in the upper part of horizon and 5 to 15 percent in the lower part

Visible secondary carbonates—0 to 10 percent as masses in the matrix and 1 to 5 percent on bottom of rock fragments

## **Fanhill Series**

The Fanhill series consists of shallow, well drained soils that formed in colluvium and residuum derived from gneiss and granitoid rocks. Fanhill soils are on mountains. Slopes range from 30 to 75 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

#### **Taxonomic Classification**

Loamy, mixed, superactive, hyperthermic, shallow Typic Haplocambids

#### **Typical Pedon**

Fanhill cobbles; Riverside County, California; on a linear, 51 percent slope under desert shrubs, about 2.1 kilometers northeast of the intersection of Berdoo Canyon Road and Dillon Road and about 145 meters due east of Berdoo Canyon Road; about



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760 meters west and 170 meters south of the northeast corner of section 20, T. 4 S., R. 8 E., San Bernardino Base and Meridian; at an elevation of 359 meters (1,178 feet); lat. 33 degrees 48 minutes 53.3 seconds N. and long. 116 degrees 10 minutes 11.7 seconds W.; USGS West Berdoo Canyon 7.5 minute topographic quadrangle; UTM 11S 0576822e 3741932n (DTM: NAD83). The surface is covered by approximately 10 percent fine gravel, 42 percent medium and coarse gravel, 30 percent cobbles, 7 percent stones, and 1 percent boulders. (Colors are for dry soil unless otherwise noted.)

- C—0 to 12 centimeters (0 to 5 inches); cobbles; single grain; loose, loose; nonsticky and nonplastic; 10 percent fine gravel, 60 percent medium and coarse gravel, 20 percent cobbles, and 2 percent stones. (5 to 12 centimeters thick)
- A—12 to 15 centimeters (5 to 6 inches); brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate very thick platy structure parting to weak thin platy; slightly hard, very friable; nonsticky and nonplastic; common very fine irregular and common fine interstitial pores; 9 percent fine gravel and 3 percent medium and coarse gravel; strongly effervescent; slightly alkaline (pH 7.6); clear smooth boundary. (3 to 4 centimeters thick)
- Bk1—15 to 38 centimeters (6 to 15 inches); light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure; soft, very friable; slightly sticky and nonplastic; 15 percent prominent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; very few very fine and moderately few very fine roots; common fine interstitial and common very fine irregular pores; 5 percent fine gravel and 25 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.
- Bk2—38 to 45 centimeters (15 to 18 inches); pale brown (10YR 6/3) gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable; slightly sticky and nonplastic; 7 percent medium to coarse prominent white (10YR 8/1) cylindrical weakly cemented calcium carbonate masses, 2 percent fine prominent white (10YR 8/1) platy weakly cemented calcium carbonate masses at the top of horizon, and 1 percent fine prominent white (10YR 8/1) calcium carbonate threads in the matrix; common very fine roots; common very fine irregular pores; 35 percent parastones, 5 percent paracobbles, and 10 percent medium and coarse gravel which breaks down to 10 percent fine gravel and 20 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.2); clear irregular boundary. (Combined thickness of the Bk horizons is 22 to 30 centimeters)
- Crk—45 to 150 centimeters (18 to 60 inches); weakly cemented, highly weathered granitoid bedrock with fractures more than 10 centimeters apart; moderate excavation difficulty; 40 percent very coarse and extremely coarse prominent white (10YR 8/1) platy weakly cemented calcium carbonate masses at the top of horizon and in cracks.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (63 to 73 degrees F)

*Surface rock fragments:* 85 to 95 percent; including 25 to 50 percent fine gravel, 25 to 35 percent medium and coarse gravel, 15 to 25 percent cobbles, 2 to 10 percent stones, and 1 to 8 percent boulders

*Control section:*

Rock fragments—10 to 25 percent

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Clay content—8 to 12 percent

Organic matter content—0 to 0.5 percent

Depth to paralithic contact—36 to 50 centimeters (14 to 20 inches)

### *A horizon:*

Value—5 or 6 dry

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sandy loam or fine sandy loam

Clay content—6 to 8 percent

Rock fragments—12 to 25 percent

### *Bk horizon:*

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4 dry

Texture of the fine-earth fraction—loamy coarse sand or sandy loam

Clay content—6 to 12 percent

Rock fragments—10 to 30 percent indurated gravel and 0 to 55 percent parafragments, including 0 to 10 percent paragravel, 0 to 5 percent paracobbles, and 0 to 35 percent parastones

## Friedliver Series

The Friedliver series consists of very deep, well drained soils that formed in alluvium from granitoid rocks. Friedliver soils are on fan aprons over fan remnants. Slopes range from 2 to 4 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

### Typical Pedon

Friedliver gravelly sand; Riverside County, California; on a north-facing, linear, 3 percent slope under desert shrubs, in Joshua Tree National Park; 190 meters (625 feet) west and 315 meters north (1,035 feet) north of the southeast corner of section 35, T. 3 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 705 meters (2,315 feet); lat. 33 degrees 51 minutes 36 seconds N. and long. 115 degrees 47 minutes 33 seconds W.; USGS Porcupine Wash 7.5 minute topographic quadrangle; UTM 11S 0611701e 3747276n (DTM: NAD83). The surface is covered by approximately 25 percent gravel and 1 percent cobbles. (Colors are for dry soil unless otherwise noted.)

A—0 to 3 centimeters (0 to 1 inch); pale brown (10YR 6/3) gravelly sand, dark gray (10YR 4/1) moist; weak thin platy structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common fine tubular pores; 25 percent gravel; very slightly effervescent; neutral (pH 7.0); clear wavy boundary. (2 to 5 centimeters thick)

AC—3 to 13 centimeters (1 to 5 inches); pale brown (10YR 6/3) gravelly coarse sand, dark grayish brown (10YR 4/2) moist; single grain; loose; nonsticky and nonplastic; many very fine and fine roots; few fine tubular pores; 25 percent gravel; slightly alkaline (pH 7.8); clear wavy boundary. (0 to 28 centimeters thick)

C—13 to 41 centimeters (5 to 16 inches); light yellowish brown (10YR 6/4) gravelly coarse sand, dark grayish brown (10YR 4/2) moist; single grain; loose; nonsticky and nonplastic; common very fine and fine and few medium roots; 20 percent gravel; very slightly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary. (10 to 38 centimeters thick)

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- 2Bt—41 to 82 centimeters (16 to 32 inches); light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, firm; slightly sticky and slightly plastic; few very fine, fine, and medium roots; few fine tubular pores; 5 percent faint clay films on faces of peds; 10 percent gravel; slightly effervescent; moderately alkaline (pH 8.1); gradual wavy boundary.
- 2Btk—82 to 100 centimeters (32 to 39 centimeters); brown (7.5YR 5/4) sandy loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, firm; slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; 20 percent distinct clay films on faces of peds; 2 percent calcium carbonate threads throughout the matrix; 10 percent gravel; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (Combined thickness of the Bt horizons is 25 to 63 centimeters)
- 2Ck—100 to 152 centimeters (39 to 60 inches); light brown (7.5YR 6/4) gravelly loamy sand, brown (7.5YR 5/4) moist; single grain; loose; slightly sticky and nonplastic; 5 percent calcium carbonate threads throughout the matrix; 15 percent gravel; strongly effervescent; moderately alkaline (pH 8.3).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 15 to 75 percent; including 15 to 75 percent gravel and 0 to 5 percent cobbles

#### *Control section:*

Clay content—10 to 18 percent

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of an argillic horizon—25 to 50 centimeters (10 to 20 inches)

#### *A horizon:*

Chroma—1 to 3 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—2 to 7 percent

Rock fragments—15 to 45 percent gravel

Effervescence—noneffervescent or very slightly effervescent

Reaction—slightly acid or neutral

#### *AC horizon:*

Chroma—3 or 4 dry; 2 to 4 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—2 to 8 percent

Rock fragments—15 to 25 percent gravel

Effervescence—noneffervescent or very slightly effervescent

Reaction—slightly acid to slightly alkaline

#### *C horizon:*

Value—5 or 6 dry

Chroma—4 to 6 dry; 2 to 4 moist

Texture of the fine-earth fraction—sand, loamy coarse sand, or loamy sand

Clay content—3 to 8 percent

Rock fragments—9 to 40 percent gravel

Effervescence—very slightly or slightly effervescent

Reaction—slightly alkaline or moderately alkaline

**2Bt and 2Btk horizons:**

Hue—7.5YR or 10YR

Value—4 to 6 dry; 4 or 5 moist

Chroma—4 to 6, dry or moist

Texture of the fine-earth fraction—coarse sandy loam, sandy loam, or sandy clay loam

Clay content—average of 10 to 18 percent; 13 to 21 percent in the lower argillic horizons

Rock fragments—5 to 30 percent gravel

Effervescence—very slightly to strongly effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline or moderately alkaline

**2Ck horizon (if it occurs):**

Hue—7.5YR or 10YR

Value—4 to 6 dry; 4 or 5 moist

Chroma—4 to 6 dry

Texture of the fine-earth fraction—loamy sand or coarse sandy loam

Clay content—6 to 12 percent

Rock fragments—10 to 25 percent gravel

Effervescence—slightly to strongly effervescent

Calcium carbonate equivalent—1 to 5 percent

## Gocougs Series

The Gocougs series consists of moderately deep, well drained soils that formed in alluvium from granitoid rocks. Gocougs soils are on fan aprons over fan remnants and on fan remnants. Slopes range from 2 to 8 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Fine-loamy, mixed, superactive, thermic Argic Petrocalcids

### Typical Pedon

Gocougs loamy coarse sand (fig. 73); Riverside County, California; on a linear, 4 percent slope under desert shrubs, approximately 2 kilometers north-northeast of the Cottonwood Visitor Center in Joshua Tree National Park; 2.7 kilometers west and 1 kilometer south of the northeast corner of section 2, T. 5 S., R. 11 E.; at an elevation of 970 meters (3,182 feet); lat. 33 degrees 45 minutes 48.86 seconds N. and long. 115 degrees 48 minutes 42.59 seconds W.; USGS Porcupine Wash, California 7.5 minute topographic quadrangle; UTM 11S 0610031e 3736576n (DTM: NAD83). The surface is covered by approximately 50 percent fine gravel and 5 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 4 centimeters (0 to 1.5 inches); brown (10YR 5/3) loamy coarse sand, yellowish brown (10YR 5/4) moist; weak thin platy structure parting to weak fine subangular blocky; soft, very friable; nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine irregular pores and few very fine interstitial pores; 5 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.5); abrupt smooth boundary. (1 to 5 centimeters thick)





Figure 73.—The Gocougs series type location. (Scale is in centimeters.)

Bw—4 to 15 centimeters (1.5 to 6 inches); yellowish brown (10YR 5/4) sand, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine interstitial pores; 13 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.5); clear wavy boundary. (0 to 52 centimeters thick)

Bt—15 to 32 centimeters (6 to 13 inches); dark yellowish brown (10YR 4/4) sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable; slightly sticky and slightly plastic; common very fine and fine and few coarse roots; common very fine tubular and interstitial pores; 3 percent faint strong brown (7.5YR 5/6) clay films on faces of peds and 3 percent faint strong brown (7.5YR 5/6) clay bridging between sand grains; 8 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.4); gradual wavy boundary.



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- Btk1**—32 to 52 centimeters (13 to 20 inches); brown (7.5YR 4/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse subangular blocky structure; moderately hard, firm; moderately sticky and moderately plastic; few fine roots; common very fine interstitial pores; 5 percent distinct strong brown (7.5YR 5/6) clay films on faces of peds and 20 percent distinct strong brown (7.5YR 5/6) clay bridging between sand grains; 2 percent distinct white (10YR 8/1) noncemented calcium carbonate threads on faces of peds with clear boundaries; 12 percent fine gravel and 3 percent medium and coarse gravel; slightly alkaline (pH 7.5); clear wavy boundary.
- Btk2**—52 to 84 centimeters (20 to 33 inches); brown (7.5YR 5/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate coarse subangular blocky structure; moderately hard, firm; moderately sticky and moderately plastic; few very fine roots; 5 percent distinct strong brown (7.5YR 5/6) clay films on faces of peds; 5 percent distinct white (10YR 8/1) irregular calcium carbonate masses in the matrix with clear boundaries; 17 percent fine gravel and 3 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.1); abrupt irregular boundary. (Combined thickness of the Bt and Btk horizons is 30 to 92 centimeters)
- Bkkm**—84 to 117 centimeters (33 to 46 inches); pale brown (10YR 6/3), crushed, very weakly cemented gravelly sandy loam, yellowish brown (10YR 5/4), crushed, moist; petrocalcic with 90 percent cementation; massive; hard, very firm; slightly sticky and slightly plastic; few very fine roots matted at top of horizon; few fine tubular pores; 35 percent faint white (10YR 8/1) calcium carbonate films on surfaces along pores and 15 percent faint white (10YR 8/1) calcium carbonate films on rock fragments; 15 percent fine gravel and 5 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (10 to 81 centimeters thick)
- Ckq**—117 to 165 centimeters (46 to 65 inches); pale brown (10YR 6/3) and light gray (10YR 7/2) gravelly coarse sand, yellowish brown (10YR 5/6) moist; massive; soft, very friable; nonsticky and nonplastic; 10 percent faint white (10YR 8/1) calcium carbonate coats on rock fragments and 1 percent distinct white (10YR 8/1) very weakly cemented irregular calcium carbonate nodules in the matrix with clear boundaries; 5 percent faint reddish yellow (7.5YR 7/6) silica films on rock fragments; 25 percent fine gravel and 5 percent medium and coarse gravel; strongly effervescent; moderately alkaline (pH 8.0).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 40 to 80 percent; including 40 to 77 percent gravel and 0 to 3 percent cobbles

#### *Control section:*

Rock fragments—2 to 25 percent; mainly gravel

Clay content—18 to 26 percent

Depth to argillic horizon—2 to 35 centimeters (1 to 14 inches)

Depth to petrocalcic horizon—50 to 100 centimeters (20 to 40 inches)

#### *A horizon:*

Value—5 or 6 dry; 3 to 5 moist

Chroma—3 or 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—loamy coarse sand, loamy sand, or fine sandy loam

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Clay content—2 to 16 percent  
Rock fragments—2 to 10 percent gravel  
Effervescence—noneffervescent to strongly effervescent  
Reaction—slightly alkaline or moderately alkaline

### *Bw horizon (if it occurs):*

Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—sand, loamy sand, or sandy loam  
Clay content—4 to 14 percent  
Rock fragments—6 to 14 percent gravel  
Effervescence—noneffervescent to strongly effervescent  
Reaction—slightly alkaline or moderately alkaline

### *Bt and/or Btk horizons:*

Hue—5YR to 10YR  
Value—4 to 7 dry; 3 to 5 moist  
Chroma—4 to 6 dry; 3 to 6 moist  
Texture of the fine-earth fraction—sandy loam, sandy clay loam, loam, or clay loam  
Clay content—average of 18 to 26 percent; ranging from 14 to 30 percent  
Rock fragments—2 to 30 percent; mainly gravel  
Effervescence—noneffervescent to violently effervescent  
Calcium carbonate equivalent—0 to 6 percent  
Reaction—neutral to moderately alkaline  
Note—calcium carbonate equivalent of Btk horizons is not enough to meet the requirements for a calcic horizon

### *Bkkm and/or Bkk horizons:*

Hue—7.5YR or 10YR  
Value—6 to 8 dry; 4 to 7 moist  
Chroma—2 to 4 dry; 4 to 6 moist  
Texture of the fine-earth fraction (when crushed)—loamy sand or sandy loam  
Clay content—8 to 15 percent  
Rock fragments—5 to 35 percent gravel  
Effervescence—strongly or violently effervescent  
Calcium carbonate equivalent—8 to 14 percent  
Cementation—extremely weak to moderate with 50 to 90 percent continuity

### *Bkq and/or Ckq horizons (if they occur):*

Value—4 to 7 dry; 4 or 5 moist  
Chroma—2 or 3 dry; 4 to 6 moist  
Texture of the fine-earth fraction—coarse sand or sand  
Clay content—0 to 10 percent  
Rock fragments—8 to 30 percent  
Effervescence—strongly or violently effervescent  
Visible secondary carbonates—0 to 45 percent as petronodes  
Silica—0 to 20 percent as silica films on petronodes and rock fragments

## Goldenbell Series

The Goldenbell series consists of shallow, well drained soils that formed in alluvium from granitoid and gneiss with an eolian influence. Goldenbell soils are on fan remnants. Slopes range from 2 to 15 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Argidic Argidurids

### Typical Pedon

Goldenbell loam; Riverside County, California; on a linear, 1 percent slope under desert pavement, from the junction of MWD Aqueduct Road and Desert Center-Rice Road, about 2 kilometers (1.25 miles) west-northwest along, and 50 meters (165 feet) north of, the MWD Aqueduct Road; about 727 meters (2,384 feet) north and 62 meters (200 feet) west of the southeast corner of section 20, T. 4 S., R. 16 E., San Bernardino Base and Meridian; at an elevation of 186 meters (610 feet); lat. 33 degrees 48 minutes 30.6 seconds N. and long. 115 degrees 18 minutes 59.3 seconds W.; USGS East of Victory Pass 7.5 minute topographic quadrangle; UTM 11S 0655827e 3742196n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 5 centimeters (0 to 2 inches); gravel; approximately 10 percent fine gravel, 78 percent medium and coarse gravel, and 10 percent cobbles; gradual wavy boundary. (4 to 9 centimeters thick)

Aq—5 to 8 centimeters (2 to 3 inches); light yellowish brown (10YR 6/4) loam, brown (7.5YR 5/4) moist; moderate thick platy structure; slightly hard, very friable; slightly sticky and moderately plastic; 5 percent very pale brown (10YR 7/4) silica coats on bottom of rock fragments; very few very fine roots; common very fine, fine, and medium and very few coarse vesicular pores; 4 percent fine gravel and 3 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.1); abrupt wavy boundary. (2 to 5 centimeters thick)

Btq—8 to 29 centimeters (3 to 11 inches); light brown (7.5YR 6/4) very gravelly loam, strong brown (7.5YR 4/6) moist; weak fine subangular blocky structure; slightly hard, friable; moderately sticky and moderately plastic; 7 percent faint brown (7.5YR 4/4) clay films on faces of peds; 65 percent very pale brown (10YR 7/4) silica coats on bottom of rock fragments; 15 percent fine gravel, 20 percent medium and coarse gravel, and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.1); clear wavy boundary. (15 to 34 centimeters thick)

Bkq—29 to 40 centimeters (11 to 16 inches); very pale brown (10YR 8/2) moderately cemented very gravelly sand, very pale brown (10YR 8/3) moist; duripan with 60 to 70 percent cementation; massive; very hard, rigid, brittle; nonsticky and nonplastic; violently effervescent; moderately alkaline (pH 8.1); abrupt wavy boundary. (6 to 25 centimeters thick)

Ckq—40 to 74 centimeters (16 to 29 inches); light yellowish brown (10YR 6/4) extremely gravelly sand, yellowish brown (10YR 5/4) moist; single grain; loose; nonsticky and nonplastic; 25 percent very pale brown (10YR 7/3) calcium carbonate coats on bottom of rock fragments; 35 percent very pale brown (10YR 7/4) silica coats on bottom of rock fragments; 30 percent fine gravel, 35 percent medium and coarse gravel, and 5 percent cobbles; slightly effervescent; slightly alkaline (pH 7.8); gradual wavy boundary.

Cq—74 to 152 centimeters (29 to 60 inches); light yellowish brown (10YR 6/4) extremely gravelly sand, yellowish brown (10YR 5/4) moist; single grain; loose; nonsticky and nonplastic; 20 percent very pale brown (10YR 7/4) silica coats on bottom of rock fragments; 30 percent fine gravel, 35 percent medium and coarse gravel, and 2 percent cobbles; very slightly effervescent; slightly alkaline (pH 7.6).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

Soil Survey of Joshua Tree National Park, California

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 90 to 100 percent; including 60 to 90 percent gravel, 10 to 25 percent cobbles, and 0 to 5 percent stones

*Control section:*

Clay content—average of 18 to 20 percent

Rock fragments—35 to 50 percent; dominantly gravel

Depth to upper boundary of an argillic horizon—8 to 15 centimeters (3 to 6 inches)

Depth to upper boundary of a duripan—25 to 36 centimeters (10 to 14 inches)

*C horizon:*

Rock fragments—90 to 100 percent; including 60 to 90 percent gravel, 10 to 25 percent cobbles, and 0 to 5 percent stones

*Aq horizon:*

Hue—10YR or 7.5YR

Value—5 to 7 dry; 4 or 5 moist

Chroma—3 or 4 moist

Texture of the fine-earth fraction—fine sandy loam or loam

Clay content—10 to 18 percent

Rock fragments—7 to 70 percent; including 7 to 65 percent gravel and 0 to 10 percent cobbles

Effervescence—slightly to violently effervescent

Reaction—neutral to moderately alkaline

Other features—horizon has vesicular pores in some pedons

*Btq horizon:*

Hue—10YR or 7.5YR

Value—4 to 6 dry

Chroma—4 to 6 dry; 3 to 6 moist

Texture of the fine-earth fraction—sandy loam or loam

Clay content—15 to 22 percent

Rock fragments—20 to 60 percent; including 20 to 40 percent gravel, 0 to 15 percent cobbles, and 0 to 2 percent stones

Effervescence—very slightly to violently effervescent

Reaction—neutral to moderately alkaline

*Bkq(m) horizon:*

Hue—10YR or 7.5YR

Value—5 to 8 dry; 4 to 8 moist

Chroma—1 to 6 dry; 2 to 6 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—1 to 5 percent

Rock fragments—35 to 60 percent; including 30 to 45 percent gravel and 0 to 10 percent cobbles

Effervescence—strongly or violently effervescent

Reaction—slightly alkaline or moderately alkaline

Cementation—weak to strong with 60 to 90 percent continuity

*Ckq or Cq horizon (if it occurs):*

Value—5 to 7 dry; 4 to 6 moist

Chroma—4 or 5, dry or moist

Texture of the fine-earth fraction—coarse sand or sand

Clay content—1 to 3 percent

Rock fragments—35 to 70 percent; including 35 to 70 percent gravel and 0 to 5 percent cobbles

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral or slightly alkaline

Visible secondary carbonates—0 to 25 percent as films on rock fragments

## Goldenhills Series

The Goldenhills series consists of deep, somewhat excessively drained soils that formed in colluvium and residuum weathered from granitoid or gneissic rocks. Goldenhills soils are on mountains. Slopes range from 30 to 75 percent. The mean annual precipitation is 100 millimeters (4 inches), and the mean annual air temperature is 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

### Typical Pedon

Goldenhills gravel; Riverside County, California; on a south-facing, 67 percent slope, approximately 24 kilometers (15 miles) north of the city of Indio; approximately 280 meters (920 feet) west and 380 meters (1,245 feet) south of the northeast corner of section 16, T. 3 S., R. 6 E., San Bernardino Base and Meridian; at an elevation of 465 meters (1,525 feet); lat. 33 degrees 54 minutes 54 seconds N. and long. 116 degrees 21 minutes 22 seconds W.; USGS East Deception Canyon 7.5 minute topographic quadrangle; UTM 11S 559509e 3752907n (DTM: NAD83). (Colors are for dry soil unless otherwise stated.)

C—0 to 6 centimeters (0 to 2 inches); gravel; 9 percent fine gravel, 35 percent medium and coarse gravel, 25 percent cobbles, 10 percent stones, and 1 percent boulders; abrupt wavy boundary. (5 to 15 centimeters thick)

A—6 to 8 centimeters (2 to 3 inches); brown (10YR 5/3) very gravelly loamy sand, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; common very fine dendritic tubular and vesicular pores; 20 percent fine gravel, 20 percent medium and coarse gravel, 10 percent cobbles, and 1 percent stones; moderately alkaline (pH 7.9); abrupt wavy boundary. (2 to 5 centimeters thick)

Bw—8 to 25 centimeters (3 to 10 inches); pale brown (10YR 6/3) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine roots; 10 percent fine gravel, 25 percent medium and coarse gravel, and 5 percent cobbles; very slightly effervescent; strongly alkaline (pH 8.5); clear smooth boundary. (0 to 54 centimeters thick)

Ck1—25 to 67 centimeters (10 to 26 inches); pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable; nonsticky and nonplastic; common very fine roots; 10 percent prominent light gray (10YR 7/2), dry, calcium carbonate coats on rock fragments; 10 percent fine gravel, 20 percent medium and coarse gravel, and 3 percent stones; strongly alkaline (pH 8.5); abrupt wavy boundary.

Ck2—67 to 120 centimeters (26 to 47 inches); brown (10YR 5/3) extremely cobbly loamy sand, brown (10YR 4/3) moist; single grain; loose; nonsticky and nonplastic; common very fine roots in cracks; 50 percent prominent light gray (10YR 7/2), dry, calcium carbonate coats on rock fragments; 5 percent fine gravel, 35 percent medium and coarse gravel, 30 percent cobbles, and 10 percent stones; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (42 to 143 centimeters thick)

R—120 to 158 centimeters (47 to 62 inches); very strongly cemented, hard granitoid bedrock with cracks more than 10 centimeters apart.



### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 80 to 95 percent; dominantly gravel

*Control section:*

Rock fragments—35 to 80 percent

Clay content—3 to 10 percent

Organic matter content—0 to 0.5 percent

Depth to a lithic contact—100 to 150 centimeters (40 to 60 inches)

*C horizon:*

Rock fragments—80 to 95 percent; including 10 to 84 percent gravel, 10 to 30 percent cobbles, 1 to 25 percent stones, and 1 to 15 percent boulders

*A horizon:*

Value—5 or 6 dry; 2 to 4 moist

Chroma—2 or 3 dry; 1 to 3 moist

Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand

Clay content—3 to 8 percent

Rock fragments—50 to 65 percent; including 35 to 55 percent gravel, 2 to 10 percent cobbles, and 0 to 20 percent stones

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly alkaline or moderately alkaline

*Bw or Bk horizon:*

Value—5 or 6 dry; 2 to 4 moist

Chroma—3 or 4 dry; 2 to 4 moist

Texture of the fine-earth fraction—loamy sand, loamy fine sand, or sandy loam

Clay content—3 to 10 percent

Rock fragments—40 to 60 percent; including 35 to 45 percent gravel, 2 to 10 percent cobbles, and 0 to 5 percent stones

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline to strongly alkaline

*Ck horizon:*

Value—5 to 8 dry; 2 to 6 moist

Chroma—1 to 4 dry; 2 to 4 moist

Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand

Clay content—1 to 10 percent

Rock fragments—30 to 85 percent; including 20 to 65 percent gravel, 3 to 15 percent cobbles, and 0 to 30 percent stones

Effervescence—noneffervescent to violently effervescent

Reaction—moderately alkaline or strongly alkaline

## Goldrose Series

The Goldrose series consists of very deep, somewhat excessively drained soils that formed in alluvium from granitoid and/or gneissic rocks. Goldrose soils are on alluvial fans. Slopes range from 4 to 8 percent. The mean annual precipitation is about 75 millimeters (3 inches), and the mean annual air temperature is about 24.5 degrees C (76 degrees F).

### Taxonomic Classification

Sandy, mixed, hyperthermic Typic Torriorthents

### Typical Pedon

Goldrose gravelly loamy fine sand (fig. 74); Riverside County, California; on a convex, 5 percent slope under desert shrubs, about 4.3 kilometers (2.7 miles) north-northwest of Red Cloud exit on Interstate 10 just north of MWD Powerline Road; 775 meters (2,543 feet) west and 800 meters (2,625 feet) south of the northeast corner of section 26, T. 5 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 482 meters (1,560 feet); lat. 33 degrees 42 minutes 27.1 seconds N. and long. 115 degrees 35 minutes 48.8 seconds W.; USGS Hayfield Spring 7.5 minute topographic quadrangle; UTM 11S 0615872e 3755531n (DTM: NAD83). The surface is covered by approximately 50 percent fine gravel and 20 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

- A—0 to 3 centimeters (0 to 1 inch); brown (10YR 5/3) gravelly loamy fine sand, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine and fine roots; 12 percent fine gravel and 3 percent medium and coarse gravel; very slightly effervescent; neutral (pH 7.3); clear wavy boundary. (2 to 6 centimeters thick)
- Bw—3 to 14 centimeters (1 to 5.5 inches); brown (10YR 5/3) gravelly sand, brown (10YR 4/3) moist; weak fine subangular blocky structure parting to single grain; soft, very friable; nonsticky and nonplastic; common very fine and fine roots; 15 percent fine gravel and 5 percent medium and coarse gravel; strongly effervescent; moderately alkaline (pH 8.1); clear wavy boundary. (0 to 92 centimeters thick)
- C1—14 to 54 centimeters (5.5 to 21 inches); pale brown (10YR 6/3) gravelly sand, brown (10YR 5/3) moist; single grain; loose; nonsticky and nonplastic; common very fine and fine and few medium roots; 20 percent fine gravel and 5 percent medium and coarse gravel; strongly effervescent; moderately alkaline (pH 8.1); gradual wavy boundary.
- C2—54 to 78 centimeters (21 to 31 inches); pale brown (10YR 6/3) gravelly coarse sand, brown (10YR 5/3) moist; single grain; loose; nonsticky and nonplastic; few very fine and fine roots; 25 percent fine gravel and 7 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.1); gradual wavy boundary.
- C3—78 to 150 centimeters (31 to 60 inches); pale brown (10YR 6/3) very gravelly coarse sand, brown (10YR 5/3) moist; single grain; loose; nonsticky and nonplastic; 30 percent fine gravel, 12 percent medium and coarse gravel, and 1 percent cobbles; slightly effervescent; moderately alkaline (pH 8.1). (Combined thickness of the C horizons is more than 50 centimeters)

### Range in Characteristics

*Soil moisture control section:* Usually dry throughout; rarely moist in some parts during winter, summer, and early fall; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (77 to 82 degrees F)

*Surface rock fragments:* 40 to 90 percent; including 40 to 70 percent gravel, 0 to 20 percent cobbles, 0 to 15 percent stones, and 0 to 2 percent boulders

#### *Control section:*

Clay content—1 to 4 percent

Organic matter content—0 to 0.5 percent

Rock fragments—average of 20 to 35 percent; average of more than 35 percent in at least one horizon or strata



Figure 74.—The Goldrose series type location. (Scale is in centimeters.)

*A horizon:*

Hue—10YR or 2.5Y

Value—5 to 7 dry; 4 or 5 moist

Chroma—3 or 4 dry; 2 or 3 moist

Texture of the fine-earth fraction—loamy coarse sand, loamy sand, or loamy fine sand

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Clay content—4 to 6 percent

Rock fragments—10 to 35 percent; including 10 to 25 percent gravel, 0 to 10 percent cobbles, and 0 to 1 percent stones

Effervescence—noneffervescent or very slightly effervescent

Reaction—neutral or slightly alkaline

### *Bw horizon (if it occurs):*

Hue—10YR or 2.5Y

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—2 to 6 percent

Rock fragments—15 to 35 percent; including 15 to 30 percent gravel and 0 to 5 percent cobbles

Effervescence—very slightly to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Other features—horizon does not meet the necessary criteria to be considered diagnostic

### *C horizon:*

Hue—10YR or 2.5Y

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—coarse sand, sand, or loamy coarse sand

Clay content—1 to 4 percent

Rock fragments—20 to 55 percent; including 15 to 55 percent gravel, 0 to 10 percent cobbles, and 0 to 1 percent stones

Effervescence—very slightly to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

## Gravesumit Series

The Gravesumit series consists of very deep, well drained soils that formed in alluvium from igneous rock. Gravesumit soils are on fan aprons over fan remnants. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Coarse-loamy, mixed, superactive, thermic Typic Calciargids

### Typical Pedon

Gravesumit-Helendale complex, 2 to 4 percent slopes; Riverside County, California; about 740 meters (2,427 feet) south and 750 meters (2,460 feet) west of the northeast corner of section 34, T. 4 S., R. 11 E.; at an elevation of 920 meters (3,018 feet); lat. 33 degrees 46 minutes 50.6 seconds N. and long. 115 degrees 49 minutes 19.1 seconds W.; USGS Porcupine Wash 7.5 minute topographic quadrangle; UTM 11S 0609070e 3738466n (DTM: NAD83). The surface is covered by approximately 35 percent fine gravel and 15 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 2 centimeters (0 to 1 inch); brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable; nonsticky and nonplastic; few very fine and fine interstitial pores; 3 percent fine gravel and 2 percent medium and coarse gravel; neutral (pH 7.3); abrupt wavy boundary.



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- Bw—2 to 19 centimeters (1 to 7.5 inches); yellowish brown (10YR 5/4) loamy fine sand, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; very few very fine and fine roots; 4 percent fine gravel and 1 percent medium and coarse gravel; very slightly effervescent; neutral (pH 7.3); clear wavy boundary.
- Bt—19 to 33 centimeters (7.5 to 13 inches); yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable; nonsticky and slightly plastic; few very fine and fine roots; 3 percent faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 3 percent fine gravel; strongly effervescent; moderately alkaline (pH 8.1); gradual wavy boundary.
- Btk—33 to 74 centimeters (13 to 29 inches); yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, firm; slightly sticky and slightly plastic; 10 percent faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 5 percent fine light gray (10YR 7/2) calcium carbonate threads in the matrix with clear boundaries; 5 percent fine gravel; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.
- C—74 to 103 centimeters (29 to 40 inches); light yellowish brown (10YR 6/4) very gravelly coarse sand, strong brown (7.5YR 4/6) moist; single grain; loose; nonsticky and nonplastic; 35 percent fine gravel and 5 percent medium and coarse gravel; slightly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.
- 2Btk—103 to 114 centimeters (40 to 45 inches); light yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; moderately hard, firm; slightly sticky and slightly plastic; 2 percent distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; 2 percent fine light gray (10YR 7/2) calcium carbonate masses in the matrix; 7 percent fine gravel; strongly effervescent; slightly alkaline (pH 7.8); gradual wavy boundary.
- 2C—114 to 152 centimeters (45 to 60 inches); light yellowish brown (10YR 6/4) gravelly coarse sand, strong brown (7.5YR 4/6) moist; massive; slightly hard, friable; nonsticky and nonplastic; 25 percent fine gravel and 5 percent medium and coarse gravel; very slightly effervescent; slightly alkaline (pH 7.6).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 15 to 65 percent gravel

#### *Control section:*

Clay content—average of 12 to 18 percent

Rock fragments—average of 3 to 20 percent; mainly gravel

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of an argillic horizon—12 to 36 centimeters (5 to 14 inches)

Depth to the upper boundary of a calcic horizon—12 to 36 centimeters (5 to 14 inches)

#### *A horizon:*

Value—5 to 7 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Clay content—4 to 10 percent



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Rock fragments—5 to 65 percent; including 5 to 65 percent gravel and 0 to 3 percent cobbles  
Effervescence—noneffervescent to slightly effervescent  
Reaction—neutral to moderately alkaline  
Calcium carbonate equivalent—0 to 1 percent

*Bw horizon:*

Value—5 to 7 dry; 4 or 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—loamy fine sand or fine sandy loam  
Clay content—2 to 10 percent  
Rock fragments—5 to 15 percent gravel  
Effervescence—noneffervescent to slightly effervescent  
Calcium carbonate equivalent—0 to 1 percent  
Reaction—neutral to moderately alkaline

*Bt and Btk horizons:*

Hue—7.5YR or 10YR, dry or moist  
Value—5 to 7 dry; 4 to 6 moist  
Chroma—3 to 6 dry; 4 to 6 moist  
Texture of the fine-earth fraction—coarse sandy loam, sandy loam, fine sandy loam, or loam  
Clay content—8 to 18 percent  
Rock fragments—3 to 30 percent; including 3 to 30 percent gravel and 0 to 3 percent cobbles  
Effervescence—slightly to violently effervescent  
Calcium carbonate equivalent—5 to 15 percent  
Reaction—slightly alkaline to strongly alkaline  
Visible secondary carbonates—0 to 10 percent calcium carbonate as masses or as threads in the matrix

*C and/or 2C horizons:*

Hue—10YR or 7.5YR, dry or moist  
Value—4 or 5 dry  
Chroma—4 or 6 moist  
Texture of the fine-earth fraction—coarse sand, loamy coarse sand, or loamy sand  
Clay content—2 to 8 percent  
Rock fragments—15 to 45 percent gravel  
Effervescence—slightly to strongly effervescent  
Calcium carbonate equivalent—0 to 1 percent  
Reaction—neutral to moderately alkaline

*2Btk horizon:*

Hue—7.5YR or 10YR, dry or moist  
Value—5 to 7 dry; 4 to 6 moist  
Chroma—3 to 6 dry; 4 to 6 moist  
Texture of the fine-earth fraction—coarse sandy loam or sandy loam  
Clay content—8 to 18 percent  
Rock fragments—3 to 30 percent; including 3 to 30 percent gravel  
Effervescence—slightly to violently effervescent  
Calcium carbonate equivalent—0 to 1 percent  
Reaction—slightly alkaline to strongly alkaline  
Visible secondary carbonates—1 to 2 percent calcium carbonate as masses or as threads in the matrix

## Grinder Series

The Grinder series consists of very shallow and shallow, well drained soils that formed dominantly in residuum from granitoid rocks. Grinder soils are on pediments and hills. Slopes range from 2 to 30 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (64.5 degrees F).

### Taxonomic Classification

Loamy, mixed, superactive, thermic Lithic Haplargids

### Typical Pedon

Grinder gravelly fine sandy loam; Riverside County, California; on a west-facing, convex, 5 percent slope under desert shrubs, approximately 3.8 kilometers (2.4 miles) north-northeast of the Cottonwood Visitor Center in Joshua Tree National Park on Pintobasin Road and 650 meters (2,132 feet) east of Pintobasin Road; 785 meters (2,574 feet) south and 435 meters (1,427 feet) east of the northwest corner of section 36, T. 4 S., R. 116 E., San Bernardino Base and Meridian; at an elevation of 967 meters (3,172 feet); lat. 33 degrees 46 minutes 49.0 seconds N. and long. 115 degrees 47 minutes 30.3 seconds W.; USGS Porcupine Wash 7.5 minute topographic quadrangle; UTM 11S 0611868e 3738449n (DTM: NAD83). The surface is covered by approximately 30 percent fine gravel, 17 percent medium and coarse gravel, and 3 percent cobbles. (Colors are for dry soil unless otherwise noted.)

A—0 to 1 centimeter (0 to 0.5 inch); yellowish brown (10YR 5/4) gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure; slightly hard, very friable; slightly sticky and slightly plastic; few very fine roots; few very fine and fine vesicular pores; 19 percent fine gravel and 1 percent medium and coarse gravel; noneffervescent; neutral (pH 7.3); abrupt smooth boundary. (1 to 3 centimeters thick)

Bt1—1 to 8 centimeters (0.5 inch to 3 inches); yellowish brown (10YR 5/6) gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable; slightly sticky and slightly plastic; few very fine and fine and very few medium roots; 2 percent faint yellowish brown (10YR 5/6) clay films on faces of peds and 5 percent faint yellowish brown (10YR 5/6) clay films on rock fragments; 24 percent fine gravel and 1 percent medium and coarse gravel; noneffervescent; slightly alkaline (pH 7.5); clear wavy boundary.

Bt2—8 to 20 centimeters (3 to 8 inches); dark yellowish brown (10YR 4/6) gravelly sandy loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; moderately hard, friable; slightly sticky and slightly plastic; very few fine and medium roots; 6 percent faint dark yellowish brown (10YR 4/6) clay films on faces of peds; 22 percent fine gravel and 3 percent medium and coarse gravel; noneffervescent; slightly alkaline (pH 7.5); abrupt irregular boundary. (Combined thickness of the Bt horizons is 12 to 20 centimeters)

R—20 centimeters (8 inches); unweathered, slightly fractured granitoid bedrock.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 50 to 98 percent; including 15 to 40 percent fine gravel, 15 to 75 percent medium and coarse gravel, 0 to 10 percent cobbles, and 0 to 2 percent stones

*Note:* Some pedons have a rock layer (C horizon) above the A horizon with 85 to 98 percent rock fragments (dominantly fine gravel)

*Control section:*

Rock fragments—10 to 35 percent gravel  
Clay content—average of 12 to 18 percent  
Organic matter content—0 to 0.25 percent  
Depth to an argillic horizon—1 to 8 centimeters (0.5 inch to 3 inches)  
Depth to a lithic contact—20 to 36 centimeters (6 to 14 inches)

*A horizon:*

Value—5 or 6 dry; 3 to 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—loamy sand, loamy fine sand, fine sandy loam, or loam  
Clay content—3 to 15 percent  
Rock fragments—10 to 30 percent gravel  
Calcium carbonate equivalent—0 to 5 percent  
Effervescence—noneffervescent to slightly effervescent  
Reaction—neutral or slightly alkaline

*Bt horizon:*

Hue—10YR or 7.5YR  
Value—3 to 5 dry; 4 or 5 moist  
Chroma—4 to 6 dry; 3 to 6 moist  
Texture of the fine-earth fraction—loamy sand, sandy loam, fine sandy loam, loam, or sandy clay loam  
Clay content—12 to 23 percent  
Rock fragments—10 to 35 percent gravel  
Calcium carbonate equivalent—0 to 5 percent  
Effervescence—noneffervescent to strongly effervescent  
Reaction—slightly alkaline or moderately alkaline

*C horizon (if it occurs):*

Hue—10YR or 7.5YR  
Clay content—2 to 8 percent  
Texture of the fine-earth fraction—sand or loamy sand  
Rock fragments—35 to 70 percent; including 30 to 65 fine gravel and 0 to 5 percent medium and coarse gravel  
Effervescence—noneffervescent or very slightly effervescent

## **Grubstake Series**

The Grubstake series consists of shallow, somewhat excessively drained soils that formed mainly in residuum from granitoid and/or gneissic rocks. Grubstake soils are on hills, mountains, and pediments. Slopes range from 2 to 75 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is 18.5 degrees C (65 degrees F).

### **Taxonomic Classification**

Loamy, mixed, superactive, thermic, shallow Typic Haplocambids

### **Typical Pedon**

Grubstake loamy fine sand; Riverside County, California; on a west-southwest-facing, linear, 3 percent slope under desert shrubs, approximately 0.46 kilometer northeast of Pinto Basin Road in Joshua Tree National Park; 515 meters (1,688 feet) east and

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135 meters (443 feet) north of the southwest corner of section 6, T. 4 S., R. 12 E., San Bernardino Base and Meridian; at an elevation of 730 meters (2,394 feet); lat. 33 degrees 50 minutes 35.9 seconds N. and long. 115 degrees 46 minutes 03.3 seconds W.; USGS Porcupine Wash 7.5 minute topographic quadrangle; UTM 11S 0614024e 3745466n (DTM: NAD83). The surface is covered by approximately 50 percent fine gravel, 24 percent medium and coarse gravel, and 1 percent cobbles. (Colors are for dry soil unless otherwise noted.)

- A—0 to 3 centimeters (0 to 1 inch); pale brown (10YR 6/3) loamy fine sand, brown (10YR 5/3) moist; weak thin platy structure; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; 9 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.8); clear wavy boundary. (1 to 10 centimeters thick)
- Bw—3 to 37 centimeters (1 to 15 inches); light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine, fine, medium, and coarse roots; 8 percent fine gravel and 2 percent medium and coarse gravel; moderately alkaline (pH 8.1); abrupt wavy boundary. (20 to 49 centimeters thick)
- Crk—37 to 45 centimeters (15 to 18 inches); fractured, weathered granitoid bedrock; fractures are more than 10 centimeters apart; few thin calcium carbonate threads in the bedrock; gradual wavy boundary. (8 to 50 centimeters thick)
- R—45 centimeters (18 inches); unfractured granitoid bedrock.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 70 to 100 percent; including 5 to 50 percent fine gravel, 10 to 80 percent medium and coarse gravel, 1 to 15 percent cobbles, 0 to 15 percent stones, and 0 to 15 percent boulders

#### *Control section:*

- Rock fragments—10 to 35 percent gravel, cobbles, and stones
- Clay content—5 to 15 percent
- Organic matter content—0 to 0.5 percent
- Depth to a paralithic contact—36 to 50 centimeters (14 to 20 inches)
- Depth to a lithic contact—45 to 100 centimeters (18 to 40 inches)

#### *A horizon:*

- Hue—10YR or 2.5Y
- Value—4 to 6 dry; 2 to 5 moist
- Chroma—3 to 5 dry; 2 to 4 moist
- Texture of the fine-earth fraction—loamy fine sand or sandy loam
- Clay content—4 to 10 percent
- Rock fragments—5 to 30 percent; including 5 to 20 percent gravel and 0 to 10 percent cobbles
- Effervescence—noneffervescent to violently effervescent
- Reaction—slightly alkaline or moderately alkaline

#### *Bw or Bk horizon:*

- Value—4 to 6 dry; 3 to 5 moist
- Chroma—3 to 6, dry or moist
- Texture of the fine-earth fraction—sandy loam or fine sandy loam
- Clay content—8 to 15 percent

Rock fragments—10 to 35 percent; including 5 to 35 percent gravel, 0 to 5 percent cobbles, and 0 to 10 percent stones  
Effervescence—noneffervescent to violently effervescent  
Reaction—slightly alkaline or moderately alkaline  
Visible secondary carbonates—0 to 15 percent calcium carbonate coats on bottom of rock fragments

## Helendale Series

The Helendale series consists of very deep, well drained soils that formed in alluvium from granitoid rocks. Helendale soils are on fan piedmonts, fan remnants, alluvial fans, and terraces. Slopes range from 0 to 15 percent. The mean annual precipitation is about 125 millimeters (5 inches), and the mean annual air temperature is about 17 degrees C (62.5 degrees F).

### Taxonomic Classification

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

### Typical Pedon

Helendale loamy sand; San Bernardino County, California; on a 2 percent slope under creosote bush, burrobush, and fiddleneck, approximately 800 meters (0.5 mile) north of Palmdale Road on Wilson Ranch Road, west of the city of Victorville; about 110 meters (360 feet) north and 110 meters (360 feet) east of the southwest corner of section 16, T. 5 N., R. 6 W., San Bernardino Base and Meridian; at an elevation of 980 meters (3,220 feet); lat. 34 degrees 30 minutes 54 seconds N. and long. 117 degrees 31 minutes 11 seconds W.; USGS Shadow Mountains SE 7.5 minute topographic quadrangle; UTM 11S 452296n 3819383e (DTM: NAD83). (When described, the soil was dry throughout.)

- A—0 to 10 centimeters (0 to 4 inches); very pale brown (10YR 7/4) loamy sand, dark yellowish brown (10YR 4/4) moist; moderate thin and medium platy structure; slightly hard, very friable; common very fine roots; common very fine interstitial pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 25 centimeters thick)
- Bt1—10 to 15 centimeters (4 to 6 inches); brown (7.5YR 5/4) sandy loam, brown (7.5YR 4/4) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, friable; sticky and slightly plastic; common very fine roots; common very fine interstitial and tubular pores; many moderately thick clay films on faces of peds, lining pores, and bridging sand grains; about 3 percent fine gravel; slightly alkaline (pH 7.6); clear smooth boundary.
- Bt2—15 to 45 centimeters (6 to 18 inches); brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate medium angular blocky; hard, friable; slightly sticky and nonplastic; few very fine roots; common very fine and fine interstitial pores; many thin clay films on faces of peds, lining pores, and bridging sand grains; about 3 percent fine gravel; slightly alkaline (pH 7.5); gradual smooth boundary.
- Bt3—45 to 75 centimeters (18 to 30 inches); brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate fine and medium angular blocky; hard, friable; slightly sticky and nonplastic; few very fine and fine roots; common very fine interstitial and few fine tubular pores; few thin clay films lining pores and bridging sand grains; 5 percent fine gravel; slightly alkaline (pH 7.5); diffuse smooth boundary.
- Bt4—75 to 98 centimeters (30 to 39 inches); brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable; slightly sticky and nonplastic; few fine roots; few very fine interstitial and few fine tubular



pores; few thin clay films lining pores and bridging sand grains; 5 percent fine gravel; slightly alkaline (pH 7.5); diffuse smooth boundary.

Bt5—98 to 120 centimeters (39 to 48 inches); yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, friable; slightly sticky and nonplastic; few fine roots; few very fine interstitial and few fine tubular pores; few thin clay films lining pores and bridging sand grains; 5 percent fine gravel; slightly alkaline (pH 7.5); clear wavy boundary. (Combined thickness of the Bt horizons is more than 50 centimeters)

Bk—120 to 165 centimeters (48 to 66 inches); light yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, very friable; nonsticky and nonplastic; strongly effervescent with carbonates segregated as few fine seams; moderately alkaline (pH 8.4); gradual wavy boundary. (0 to 19 inches thick)

C—165 to 265 centimeters (66 to 106 inches); yellow (10YR 7/6) loamy sand, yellowish brown (10YR 5/6) moist; massive; hard, very friable; slightly effervescent with carbonates disseminated and segregated as few fine seams; moderately alkaline (pH 8.4).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C

*Organic matter content:* 0 to 0.5 percent

#### *Control section:*

Clay content—8 to 18 percent

Depth to the upper boundary of an argillic horizon—2 to 25 centimeters (1 to 10 inches)

Effervescence—generally noneffervescent; very slightly to strongly effervescent below a depth of 60 centimeters

#### *A horizon:*

Hue—7.5YR or 10YR

Value—5 to 7, dry or moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—loamy sand, loamy fine sand, or sandy loam

Clay content—4 to 12 percent

Rock fragments—5 to 20 percent; dominantly gravel

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly alkaline or moderately alkaline

#### *BA horizon (if it occurs):*

Value—4 or 6 dry; 4 or 5 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—4 or 5 percent

Reaction—slightly alkaline or moderately alkaline

#### *Bt horizon:*

Hue—7.5YR or 10YR

Value—5 or 6 dry

Chroma—3 to 6, dry or moist

Texture of the fine-earth fraction—coarse sandy loam, sandy loam, fine sandy loam, or loam

Clay content—average of 8 to 18 percent

Rock fragments—5 to 15 percent; dominantly gravel  
Reaction—slightly alkaline or moderately alkaline

*Bk or Bkq horizon (if it occurs):*

Hue—7.5YR or 10YR  
Value—4 to 6, dry or moist  
Chroma—3 to 6 dry; 3 or 4 moist  
Texture of the fine-earth fraction—loamy sand, loamy fine sand, or sandy loam  
Rock fragments—5 to 20 percent; dominantly gravel  
Calcium carbonate equivalent—0 to 2 percent  
Silica—0 to 2 percent as durinodes in the matrix

*C or Ck horizon:*

Hue—7.5YR, 10YR, or 2.5Y  
Value—6 to 8 dry  
Chroma—3 to 6 moist  
Texture of the fine-earth fraction—sand, loamy sand, loamy fine sand, or sandy loam  
Rock fragments—5 to 25 percent  
Calcium carbonate equivalent—0 to 2 percent  
Reaction—slightly alkaline or moderately alkaline

## Hexie Series

The Hexie series consists of moderately deep, well drained soils that formed in colluvium over residuum derived from gneiss and/or granitoid rocks. Hexie soils are on hills and mountains. Slopes range from 15 to 60 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

### Typical Pedon

Hexie sandy loam; Riverside County, California; on a 36 percent slope under desert shrubs, about 2.5 kilometers south of the intersection of Geology Tour Road and Berdoo Canyon Road and due east of Berdoo Canyon Road about 2.7 kilometers, in Joshua Tree National Park; 429 meters west and 32 meters north of the southeast corner of section 22, T. 3 S., R. 9 E., San Bernardino Base and Meridian; at an elevation of 1,166 meters (3,825 feet); lat. 33 degrees 53 minutes 19.1 seconds N. and long. 116 degrees 01 minute 24.0 seconds W.; USGS Malapai Hill 7.5 minute topographic quadrangle; UTM 11S 0590313e 3750239n (DTM: NAD83). The surface is covered by approximately 10 percent fine gravel, 50 percent medium and coarse gravel, 10 percent cobbles, 3 percent stones, and 2 percent boulders. (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 centimeters (0 to 1 inch); yellowish brown (10YR 5/4) very gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common fine interstitial and few fine tubular pores; 15 percent fine gravel and 30 percent medium and coarse gravel; slightly alkaline (pH 7.5); clear smooth boundary.

A2—3 to 12 centimeters (1 to 5 inches); yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; moderate fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine and fine and few medium roots; common fine interstitial and few fine tubular pores;

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7 percent fine gravel and 8 percent medium and coarse gravel; slightly alkaline (pH 7.6); clear smooth boundary. (Combined thickness of A horizons is 7 to 16 centimeters)

- Bt**—12 to 22 centimeters (5 to 9 inches); yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 3/6) moist; moderate medium subangular blocky structure; slightly hard, friable; slightly sticky and nonplastic; many very fine and few fine roots; common very fine tubular and fine interstitial pores; 5 percent faint strong brown (7.5YR 4/6) clay films bridging sand grains; 15 percent fine gravel, 10 percent medium and coarse gravel, and 5 percent cobbles; slightly alkaline (pH 7.8); abrupt wavy boundary. (10 to 57 centimeters thick)
- Btk**—22 to 98 centimeters (9 to 39 inches); dark yellowish brown (10YR 4/4) extremely paracobbly sandy loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable; slightly sticky and slightly plastic; moderately few very fine roots; common very fine dendritic tubular pores; 25 percent distinct strong brown (7.5YR 4/6) clay films on rock fragments and 5 percent faint strong brown (7.5YR 4/6) clay films on faces of peds; 10 percent prominent white (10YR 8/1), dry, calcium carbonate masses lining pores; 7 percent indurated fine gravel, 20 percent fine paragravel, 20 percent medium and coarse paragravel, and 30 percent paracobbles; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (0 to 76 centimeters thick)
- Cr**—98 to 150 centimeters (39 to 60 inches); moderately hard, moderately weathered fractured gneiss; fractures are more than 10 centimeters apart; moderate excavation difficulty.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 35 to 70 percent; including 10 to 20 percent fine gravel, 3 to 50 percent medium and coarse gravel, 5 to 15 percent cobbles, 0 to 7 percent stones, and 0 to 3 percent boulders

#### *Control section:*

Rock fragments—average of 5 to 30 percent; dominantly indurated gravel with 0 to 70 percent pararock fragments

Clay content—12 to 18 percent

Organic matter content—0 to 0.5 percent

Depth to argillic horizon—7 to 25 centimeters (3 to 10 inches)

Depth to paralithic contact—50 to 100 centimeters (20 to 40 inches)

#### *A horizon:*

Hue—7.5YR or 10YR

Value—4 or 5 dry

Chroma—3 or 4 dry; 2 to 4 moist

Clay content—6 to 10 percent

Rock fragments—15 to 55 percent

Reaction—neutral or slightly alkaline

#### *Bt and/or Btk horizons:*

Hue—7.5YR or 10YR

Value—4 or 5 dry; 3 or 4 moist

Chroma—4 or 6 dry; 2 to 6 moist

Texture of the fine-earth fraction—sandy loam, fine sandy loam, or loam

Clay content—8 to 18 percent

Rock fragments—2 to 34 percent indurated fragments with 0 to 70 percent  
pararock fragments; typically in the lower part of the profile  
Effervescence—noneffervescent to violently effervescent  
Reaction—slightly alkaline or moderately alkaline

## Hypoint Series

The Hypoint series consists of very deep, somewhat excessively drained soils that formed in alluvium from igneous rock. Hypoint soils are on fan aprons. Slopes range from 1 to 4 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Sandy, mixed, thermic Typic Torriorthents

### Typical Pedon

Cajon-Hypoint-Arizo association, 1 to 4 percent slopes; Riverside County, California; about 535 meters (1,755 feet) west and 85 meters (279 feet) east of the northeast corner of section 34, T. 4 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 911 meters (2,988 feet); lat. 33 degrees 47 minutes 12.1 seconds N. and long. 115 degrees 49 minutes 10.4 seconds W.; USGS Porcupine Wash, California 7.5 minute topographic quadrangle; UTM 11S 0609285e 3739132n (DTM: NAD83). The surface is covered by approximately 30 percent fine gravel, 45 percent medium and coarse gravel, and 3 percent cobbles. (Colors are for dry soil unless otherwise noted.)

- A—0 to 2 centimeters (0 to 1 inch); brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; weak medium granular structure; soft, very friable; nonsticky and nonplastic; few very fine and fine roots; 9 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.5); clear wavy boundary.
- Bw—2 to 48 centimeters (1 to 19 inches); yellowish brown (10YR 5/4) sand, dark yellowish brown (10YR 4/4) moist; massive parting to weak fine subangular blocky structure; soft, friable; nonsticky and nonplastic; few very fine and fine and very few medium roots; 9 percent fine gravel and 3 percent medium and coarse gravel; very slightly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.
- C—48 to 152 centimeters (19 to 60 inches); pale brown (10YR 6/3) very gravelly sand, brown (10YR 5/3) moist; single grain; loose; nonsticky and nonplastic; 20 percent fine gravel, 15 percent medium and coarse gravel, and 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.1).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

#### *Control section:*

Rock fragments—average of 15 to 35 percent; ranging to 50 percent in at least one horizon or strata  
Clay content—1 to 5 percent  
Organic matter content—0 to 0.5 percent  
Effervescence—noneffervescent to slightly effervescent

#### *A horizon:*

Value—5 to 7 dry  
Chroma—2 to 4, dry or moist

Rock fragments—5 to 15 percent gravel  
Reaction—neutral to moderately alkaline

***Bw and C horizons:***

Value—5 or 6 dry; 4 or 5 moist  
Rock fragments—average of 15 to 35 percent; ranging from 5 to 50 percent in individual strata  
Calcium carbonate equivalent in the fine-earth fraction—0 to 5 percent  
Reaction—neutral to moderately alkaline  
Visible secondary carbonates—0 to 5 percent calcium carbonate coats on rock fragments

## **Impedimenta Series**

The Impedimenta series consists of very shallow, somewhat excessively drained soils that formed from dominantly granitoid residuum. Impedimenta soils are on pediments, hills, and mountain backslopes. Slopes range from 4 to 30 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### **Taxonomic Classification**

Mixed, hyperthermic Lithic Torripsamments

### **Typical Pedon**

Impedimenta gravelly loamy sand; San Bernardino County, California; on a north-northwest-facing, convex, 16 percent slope under desert shrubs, approximately 4.1 kilometers west of the junction of Highway 62 and Coxcomb Adit Trail; 67 meters (220 feet) south and 564 meters (1,850 feet) west of the northeast corner of section 12, T. 1 S., R. 14 E., San Bernardino Base and Meridian; at an elevation of 645 meters (2,090 feet); lat. 34 degrees 06 minutes 22.7 seconds N. and long. 115 degrees 27 minutes 44.3 seconds W.; USGS Cadiz Valley SW 7.5 minute topographic quadrangle; UTM 11S 0641833e 3775009n (DTM: NAD83). The surface is covered by approximately 15 percent fine gravel, 55 percent medium and coarse gravel, 8 percent cobbles, and 1 percent stones. (Colors are for dry soil unless otherwise noted.)

- A—0 to 2 centimeters (0 to 1 inch); yellowish brown (10YR 5/4) gravelly loamy sand, brown (10YR 5/3) moist; weak thin platy structure; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; few fine vesicular and common fine interstitial pores; 15 percent fine gravel and 10 percent medium and coarse gravel; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (1 to 3 centimeters thick)
- C—2 to 10 centimeters (1 to 4 inches); very pale brown (10YR 7/4) gravelly sand, pale brown (10YR 6/3) moist; massive; soft, very friable; nonsticky and nonplastic; few very fine and fine and very few coarse roots; 15 percent fine gravel and 5 percent medium and coarse gravel; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 15 centimeters thick)
- R—10 centimeters (4 inches); unweathered, slightly fractured granitic bedrock with fractures 10 to 15 centimeters apart; few coarse roots in fractures.

### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)



*Surface rock fragments:* 55 to 80 percent; including 10 to 30 percent fine gravel, 35 to 55 percent medium and coarse gravel, 1 to 10 percent cobbles, 0 to 10 percent stones, and 0 to 1 percent boulders

*Control section:*

Depth to a lithic contact—3 to 18 centimeters (1 to 7 inches)

Rock fragments—15 to 30 percent gravel and cobbles

Clay content—2 to 6 percent

Organic matter content—0 to 0.25 percent

*A horizon:*

Hue—10YR or 2.5Y

Value—5 to 7 dry; 4 or 5 moist

Chroma—3 or 4 dry; 2 or 3 moist

Clay content—3 to 6 percent

Rock fragments—10 to 25 percent gravel

Effervescence—noneffervescent to violently effervescent

Calcium carbonate equivalent—0 to 1 percent

Reaction—neutral to moderately alkaline

*C horizon (if it occurs):*

Hue—10YR or 2.5Y

Value—5 to 7 dry; 5 or 6 moist

Chroma—3 or 4 dry

Texture of the fine-earth fraction—sand or loamy sand

Clay content—2 to 4 percent

Rock fragments—20 to 30 percent; including 20 to 30 percent gravel and 0 to 5 percent cobbles

Effervescence—noneffervescent to violently effervescent

Calcium carbonate equivalent—0 to 1 percent

Reaction—neutral to moderately alkaline

## Ironage Series

The Ironage series consists of moderately deep, well drained soils that formed in gneissic residuum. Ironage soils are on mountains. Slopes range from 15 to 60 percent. The mean annual precipitation is 100 millimeters (4 inches), and the mean annual air temperature is 21.5 degrees C (70.5 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Typic Calciargids

### Typical Pedon

Ironage cobbles; San Bernardino County, California; on a southeast-facing, linear, 42 percent slope under desert shrubs, approximately 4 miles southeast of the junction of Highway 62 and Iron Age Road; 25 meters (81 feet) south and 420 meters (1,361 feet) west of the northeast corner of section 29, T. 1 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 618 meters (2,002 feet); lat. 34 degrees 03 minutes 50.2 seconds N. and long. 115 degrees 38 minutes 08.6 seconds W.; USGS New Dale, California 7.5 minute topographic quadrangle; UTM 11S 0625898e 3770083n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 16 centimeters (0 to 6 inches); cobbles; 20 percent fine gravel, 20 percent medium and coarse gravel, 35 percent cobbles, and 20 percent stones; abrupt wavy boundary. (12 to 16 centimeters thick)

- A—16 to 22 centimeters (6 to 9 inches); pale brown (10YR 6/3) very gravelly fine sandy loam, light olive brown (2.5Y 5/3) moist; weak thin platy structure; soft, very friable; nonsticky and nonplastic; few very fine roots; few medium interstitial pores; 15 percent fine gravel, 15 percent medium and coarse gravel, and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.3); clear wavy boundary. (2 to 6 centimeters thick)
- Bkq—22 to 33 centimeters (9 to 13 inches); light yellowish brown (10YR 6/4) very gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure parting to moderate medium granular; slightly hard, very friable; nonsticky and slightly plastic; few very fine and very few fine roots; few fine interstitial pores; 20 percent distinct very pale brown (10YR 7/3) calcium carbonate coats on bottom of rock fragments; 5 percent faint light yellowish brown (10YR 6/4) silica coats on bottom of rock fragments; 15 percent fine gravel, 15 percent medium and coarse gravel, and 10 percent cobbles; violently effervescent (calcium carbonate equivalent of 5 percent); moderately alkaline (pH 8.3); clear wavy boundary.
- Btkq1—33 to 45 centimeters (13 to 18 inches); light yellowish brown (10YR 6/4) extremely gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable; nonsticky and slightly plastic; few very fine and fine and very few medium and coarse roots; 10 percent prominent strong brown (7.5YR 5/6) clay films on rock fragments; 15 percent prominent very pale brown (10YR 7/3) calcium carbonate coats on bottom of rock fragments; 5 percent faint light yellowish brown (10YR 6/4) silica films on rock fragments; 30 percent fine gravel, 30 percent medium and coarse gravel, and 5 percent cobbles; strongly effervescent (calcium carbonate equivalent of 5 percent); moderately alkaline (pH 8.2); gradual wavy boundary.
- Btkq2—45 to 60 centimeters (18 to 24 inches); very pale brown (10YR 7/3) extremely gravelly sandy loam, light yellowish brown (2.5Y 6/3) moist; massive; moderately hard, friable; slightly sticky and slightly plastic; very few fine and medium roots; 5 percent prominent strong brown (7.5YR 5/6) clay films on rock fragments; 10 percent distinct very pale brown (10YR 7/3) calcium carbonate coats on bottom of rock fragments and 10 percent faint fine very pale brown (10YR 8/2) irregular calcium carbonate masses within the matrix; 10 percent distinct light gray (10YR 7/2) silica coats on bottom of rock fragments; 30 percent fine gravel, 30 percent medium and coarse gravel, and 1 percent cobbles; violently effervescent (calcium carbonate equivalent of 19 percent); moderately alkaline (pH 8.2); abrupt wavy boundary. (Combined thickness of the Btk horizons is 18 to 45 centimeters)
- R—60 centimeters (24 inches); unfractured gneissic bedrock.

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and October following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 85 to 95 percent; including 25 to 65 percent gravel, 20 to 45 percent cobbles, 10 to 20 percent stones, and 0 to 5 percent boulders

*Control section:*

Rock fragments—35 to 75 percent; including 30 to 60 percent gravel, 1 to 40 percent cobbles, and 0 to 5 percent stones

Clay content—8 to 18 percent

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of a calcic horizon—25 to 50 centimeters (10 to 20 inches)

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Depth to the upper boundary of an argillic horizon—25 to 45 centimeters (10 to 18 inches)

Depth to a lithic contact—50 to 100 centimeters (20 to 40 inches)

### *C horizon:*

Rock fragments—85 to 95 percent; including 15 to 35 percent fine gravel, 10 to 30 percent medium and coarse gravel, 20 to 45 percent cobbles, 10 to 20 percent stones, and 0 to 5 percent boulders

### *A horizon:*

Hue—10YR or 2.5Y

Value—4 or 5 moist

Chroma—3 or 4 dry; 2 to 4 moist

Texture of the fine-earth fraction—loamy fine sand or fine sandy loam

Clay content—6 to 10 percent

Rock fragments—35 to 60 percent; including 30 to 50 percent gravel, 5 to 20 percent cobbles, and 0 to 2 percent stones

Effervescence—very slightly to strongly effervescent

Calcium carbonate equivalent—1 to 5 percent

Reaction—neutral to moderately alkaline

### *Bkq and Btkq horizons:*

Hue—7.5YR, 10YR, or 2.5Y

Value—6 or 7 dry; 5 or 6 moist

Chroma—2 to 4 moist; 3 or 4 dry

Texture of the fine-earth fraction—sandy loam, fine sandy loam, or loam

Clay content—8 to 18 percent

Rock fragments—35 to 75 percent; including 30 to 60 percent gravel, 1 to 30 percent cobbles, and 0 to 15 percent stones

Effervescence—strongly or violently effervescent

Calcium carbonate equivalent—5 to 25 percent

Silica—0 to 10 percent as coats on bottom of rock fragments

## Ironlung Series

The Ironlung series consists of very shallow and shallow, somewhat excessively drained soils that formed in residuum and colluvium weathered from granitoid and gneissic rock. Ironlung soils are on mountains. Slopes range from 30 to 75 percent. The average annual precipitation is 100 millimeters (4 inches), and the average annual air temperature is 21.5 degrees C (71 degrees F).

### **Taxonomic Classification**

Sandy-skeletal, mixed, hyperthermic, shallow Typic Torriorthents

### **Typical Pedon**

Ironlung very gravelly sand; Riverside County, California; on a southwest-facing, 46 percent slope, approximately 6.5 kilometers (4 miles) northeast of the town of Desert Hot Springs, in Joshua Tree National Park; approximately 785 meters (2,575 feet) west and 85 meters (280 feet) south of the northeast corner of section 26, T. 2 S., R. 5 E., San Bernardino Base and Meridian; at an elevation of 627 meters; lat. 33 degrees 58 minutes 28.8 seconds N. and long. 116 degrees 25 minutes 54.2 seconds W.; USGS Seven Palms Valley 7.5 minute topographic quadrangle; UTM 11S 552495e 3759491n (DTM: NAD83). The surface is covered by approximately 40 percent fine gravel, 10 percent medium and coarse gravel, and 10 percent cobbles. (Colors are for dry soil unless otherwise stated.)

- A—0 to 4 centimeters (0 to 2 inches); pale brown (10YR 6/3) very gravelly sand, very dark grayish brown (10YR 3/2) moist; weak very thick platy structure; soft, very friable; nonsticky and nonplastic; common very fine roots; few very fine interstitial pores; 15 percent fine gravel, 10 percent medium gravel, and 10 percent cobbles; slightly alkaline (pH 7.5); clear wavy boundary. (2 to 5 centimeters thick)
- C—4 to 14 centimeters (2 to 6 inches); pale brown (10YR 6/3) very gravelly coarse sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; nonsticky and nonplastic; common very fine roots; few very fine interstitial pores; 10 percent paracobbles, 35 percent medium and coarse paragravel, and 10 percent fine paragravel breaking down to 20 percent medium and coarse indurated gravel and 20 percent fine indurated gravel; slightly alkaline (pH 7.5); abrupt wavy boundary. (8 to 29 centimeters thick)
- Cr—14 to 150 centimeters (6 to 60 inches); weakly cemented, soft granitoid bedrock with cracks more than 10 centimeters apart; moderate excavation difficulty.

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 30 to 70 percent; dominantly gravel

#### *Control section:*

Rock fragments—35 to 60 percent

Organic matter content—0 to 0.5 percent

Clay content—1 to 5 percent

Depth to paralithic contact—10 to 36 centimeters (4 to 14 inches)

#### *A horizon:*

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4 dry; 2 to 4 moist

Clay content—1 to 5 percent

Rock fragments—35 to 60 percent; dominantly gravel

Reaction—neutral to moderately alkaline

#### *C horizon:*

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 or 4 dry; 2 to 6 moist

Texture—coarse sand, sand, loamy sand, or loamy fine sand

Clay content—1 to 5 percent

Rock fragments—35 to 100 percent; including 35 to 60 percent indurated gravel, 0 to 10 percent fine paragravel, 0 to 35 medium and coarse paragravel, and 0 to 10 percent paracobbles

Effervescence—noneffervescent or very slightly effervescent

Reaction—neutral to moderately alkaline

## Ironped Series

The Ironped series consists of very shallow and shallow, somewhat excessively drained soils that formed in granitic, granitoid, and gneissic residuum and colluvium. Ironped soils are on pediments, hills, and mountains. Slopes range from 2 to 60 percent. The mean annual precipitation is about 125 millimeters (5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### **Taxonomic Classification**

Mixed, thermic, shallow Typic Torripsamments

### **Typical Pedon**

Ironped gravelly loamy sand; San Bernardino County, California, approximately 60 kilometers north of the survey area; on a linear, 5 percent slope, approximately 1.0 kilometer west of the Iron Ridge Mountains; 0.7 kilometer south and 0.1 kilometer west of the northeast corner of section 20, T. 6 N., R. 4 E., San Bernardino Base and Meridian; at an elevation of 1,098 meters; lat. 34 degrees 35 minutes 51.1 seconds N. and long. 116 degrees 34 minutes 32.0 seconds W.; USGS Iron Ridge 7.5 minute topographic quadrangle; UTM 11S 538919e 3828494n (DTM: NAD83). The surface is covered by approximately 50 percent gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 4 centimeters (0 to 2 inches); very pale brown (10YR 7/4) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; moderate thick platy structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common very fine tubular pores; 30 percent gravel; very slightly effervescent; slightly alkaline (pH 7.4); clear wavy boundary. (2 to 13 centimeters thick)

Bw—4 to 15 centimeters (2 to 6 inches); light yellowish brown (10YR 6/4) gravelly loamy sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common very fine tubular pores; 25 percent gravel; very slightly effervescent; slightly alkaline (pH 7.6); abrupt wavy boundary. (0 to 27 centimeters thick)

Crtk—15 to 150 centimeters (6 to 60 inches); slightly weathered granitic bedrock with fractures more than 10 centimeters apart; slight to moderate excavation difficulty; common very fine and few fine and medium roots in fractures; 30 percent distinct strong brown (7.5YR 5/6) clay films in fractures and on rock fragments; 1 percent distinct fine white (10YR 8/1) calcium carbonate threads on rock fragments; 5 percent distinct white (10YR 8/1) calcium carbonate coats on rock fragments.

### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C

*Surface rock fragments:* 5 to 80 percent; including 5 to 70 percent fine gravel, 0 to 15 percent medium and coarse gravel, 0 to 5 percent cobbles, and 0 to 2 percent stones

#### *Control section:*

Rock fragments—2 to 34 percent; including 0 to 30 percent gravel and 0 to 5 percent cobbles

Organic matter content—0 to 0.5 percent

Clay content—2 to 8 percent

Depth to paralithic contact—5 to 35 centimeters (2 to 14 inches)

#### *A horizon:*

Value—5 to 7 dry; 3 to 5 moist

Chroma—3 to 5 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—3 to 8 percent

Rock fragments—2 to 34 percent; including 0 to 30 percent gravel and 0 to 5 percent cobbles



Effervescence—noneffervescent to slightly effervescent

Reaction—slightly acid to moderately alkaline

*Bw horizon (if it occurs):*

Value—3 to 6 dry; 3 to 5 moist

Chroma—3 to 6, dry or moist

Clay content—2 to 8 percent

Texture of the fine-earth fraction—coarse sand, sand, or loamy sand

Rock fragments—2 to 30 percent; including 0 to 20 percent gravel and 0 to 10 percent cobbles

Effervescence—noneffervescent to violently effervescent

Reaction—neutral to moderately alkaline

## Jadestorm Series

The Jadestorm series consists of very shallow and shallow, somewhat excessively drained soils that formed in residuum and colluvium from gneissic and granitoid rocks. Jadestorm soils are on hills and mountains. Slopes range from 15 to 75 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic, shallow Typic Torriorthents

### Typical Pedon

Jadestorm cobbles; Riverside County, California; on a linear, 32 percent slope under desert shrubs, in Joshua Tree National Park; 3 kilometers east and 1 kilometer south of the southeast corner of section 35, T. 4 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 655 meters (2,150 feet); lat. 33 degrees 54 minutes 45 seconds N. and long. 115 degrees 38 minutes 57 seconds W.; USGS Conejo Well 7.5 minute topographic quadrangle; UTM 11S 624980e 3745877n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 6 centimeters (0 to 2.5 inches); cobbles; 40 percent gravel, 30 percent cobbles, 5 percent stones, and 1 percent boulders. (2 to 10 centimeters thick)

A—6 to 8 centimeters (2.5 to 3 inches); pale brown (10YR 6/3) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable; slightly sticky and slightly plastic; common very fine roots; few fine tubular pores; 50 percent gravel and 5 percent cobbles; strongly effervescent; slightly alkaline (pH 7.6); clear wavy boundary. (2 to 11 centimeters thick)

Bw—8 to 25 centimeters (3 to 10 inches); pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; slightly sticky and slightly plastic; many very fine and fine and common medium roots; few fine tubular pores; 50 percent gravel and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary. (3 to 25 centimeters thick)

Cr—25 to 42 centimeters (10 to 16 inches); weathered gneissic bedrock; gradual irregular boundary. (5 to 17 centimeters thick)

R—42 centimeters (16 inches); unweathered, fractured gneissic bedrock with high or very high excavation difficulty.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and

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September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 80 to 95 percent; including 5 to 20 percent fine gravel, 40 to 70 percent medium and coarse gravel, 10 to 45 percent cobbles, 0 to 12 percent stones, and 0 to 5 percent boulders

*Organic matter content:* 0 to 0.5 percent

*Depth to a paralithic contact:* 10 to 36 centimeters

*Depth to a lithic contact:* 15 to 65 centimeters

### *C horizon:*

Rock fragments—80 to 95 percent; including 5 to 20 percent fine gravel, 40 to 70 percent medium and coarse gravel, 10 to 45 percent cobbles, 0 to 12 percent stones, and 0 to 5 percent boulders

### *A horizon:*

Value—5 or 6 dry; 3 to 5 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—loamy sand or sandy loam

Clay content—4 to 12 percent

Rock fragments—25 to 70 percent; including 25 to 60 percent gravel, 0 to 15 percent cobbles, and 0 to 2 percent stones

Effervescence—slightly to violently effervescent

Reaction—neutral to moderately alkaline

### *Bw or Bk horizon:*

Value—5 or 6 dry; 3 to 5 moist

Chroma—3 or 4 dry; 2 to 6 moist

Texture of the fine-earth fraction—sandy loam or loam

Clay content—6 to 16 percent

Rock fragments—35 to 75 percent; including 0 to 60 percent gravel, 0 to 30 percent cobbles, and 0 to 2 percent stones

Effervescence—strongly or violently effervescent

Reaction—slightly alkaline or moderately alkaline

## Jetmine Series

The Jetmine series consists of well drained soils that are shallow to a duripan and that formed in mixed alluvium from rhyolite and metamorphic sources. Jetmine soils are on fan remnants. Slopes range from 4 to 8 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Loamy, mixed, superactive, thermic, shallow Cambidic Haplodurids

### Typical Pedon

Jetmine coarse sandy loam; Clark County, Nevada; on a 5 percent slope, approximately 3½ miles north of Searchlight, Nevada, in the south end of Eldorado Valley; about 2,810 feet south and 1,000 feet east of the northwest corner of section 12, T. 28 S., R. 63 E.; at an elevation of 968 meters (3,175 feet); lat. 35 degrees 31 minutes 24 seconds N. and long. 114 degrees 53 minutes 52 seconds W.; USGS Nelson SW, Nevada 7.5 minute topographic quadrangle; UTM 11s 690615e 3933112n (DTM: NAD 83). The surface is covered by approximately 50 percent gravel and 2 percent cobbles. (Colors are for dry soil unless otherwise noted.)

A—0 to 5 centimeters (0 to 2 inches); yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak thick platy structure; soft, very friable; slightly sticky and slightly plastic; many very fine roots; many very fine and few fine interstitial pores; 10 percent gravel; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (1 to 4 inches thick)

Bk—5 to 40 centimeters (2 to 16 inches); light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; soft, very friable; slightly sticky and slightly plastic; many very fine and few fine and medium roots; common very fine and few fine interstitial and tubular pores; common thin calcium carbonate coats on bottom of rock fragments; 10 percent gravel; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (10 to 16 inches thick)

Bqkm—40 to 150 centimeters (16 to 60 inches); white (10YR 8/1) weakly cemented duripan, very pale brown (10YR 8/3) moist; massive; hard, very firm, brittle; few very fine roots; discontinuous weakly cemented silica and calcium carbonate; 1-millimeter laminar cap; 20 percent discontinuous strong cementation in the upper part; more than 4 inches between fractures with few very fine roots in fractures; violently effervescent.

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July to September following summer convection storms

*Soil temperature:* 15 to 17.5 degrees (59 to 63 degrees F)

*Depth to a duripan:* 14 to 20 inches

*Reaction:* Moderately alkaline or strongly alkaline

*Control section:*

Clay content—8 to 17 percent

Rock fragments—5 to 30 percent; mainly gravel

*A horizon:*

Value—5 or 6 dry

*Bk horizon:*

Value—4 or 5 moist

Texture—sandy loam or fine sandy loam

Rock fragments—5 to 30 percent; mainly gravel

*Bqkm horizon:*

Texture—weakly to strongly cemented silica and calcium carbonate

## Joetree Series

The Joetree series consists of very deep, somewhat excessively drained soils that formed in alluvium from granitoid rocks. Joetree soils are on fan aprons overlying fan remnants. Slopes range from 0 to 8 percent. The mean annual precipitation is 100 millimeters (4 inches), and the mean annual air temperature is 21.5 degrees C (71 degrees F).

#### Taxonomic Classification

Mixed, hyperthermic Typic Torripsamments

#### Typical Pedon

Joetree loamy sand; Riverside County, California; on a linear, northeast-facing, 3 percent slope under desert shrubs, about 170 meters (560 feet) south of Highway 62

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and about 6.5 kilometers (4 miles) west-northwest of the junction of Highway 62 and Highway 177; about 585 meters (1,919 feet) west and 10 meters (33 feet) south of the northeast corner of section 27, T. 1 S., R. 16 E., San Bernardino Base and Meridian; at an elevation of 284 meters (931 feet); lat. 34 degrees 03 minutes 47.2 seconds N. and long. 115 degrees 17 minutes 11.8 seconds W.; USGS Cadiz Valley SE 7.5 minute topographic quadrangle; UTM 11S 0658119e 3770478n (DTM: NAD83). The surface is covered by approximately 40 percent fine gravel and 25 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

- A—0 to 4 centimeters (0 to 1.5 inches); pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; common fine and few medium vesicular pores; 3 percent fine gravel and 2 percent medium and coarse gravel; neutral (pH 7.2); abrupt wavy boundary. (1 to 5 centimeters thick)
- C1—4 to 17 centimeters (1.5 to 7 inches); light yellowish brown (10YR 6/4) loamy sand, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; 3 percent fine gravel and 2 percent medium and coarse gravel; very slightly effervescent; moderately alkaline (pH 7.9); clear wavy boundary.
- C2—17 to 53 centimeters (7 to 21 inches); light yellowish brown (10YR 6/4) gravelly sand, yellowish brown (10YR 5/6) moist; single grain; loose; nonsticky and nonplastic; few very fine, fine, and medium roots; 15 percent fine gravel and 5 percent medium and coarse gravel; very slightly effervescent; moderately alkaline (pH 8.1); clear wavy boundary.
- C3—53 to 110 centimeters (21 to 43 inches); yellowish brown (10YR 5/6) loamy sand, brown (7.5YR 5/4) moist; massive parting to weak fine subangular blocky structure; slightly hard, friable; nonsticky and nonplastic; very few fine and medium roots; 3 percent fine gravel and 2 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.2); very abrupt wavy boundary. (Combined thickness of the C horizons is 95 to 124 centimeters)
- Btb—110 to 164 centimeters (43 to 64 inches); strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 4/6) moist; weak fine subangular blocky structure; moderately hard, firm; slightly sticky and moderately plastic; 25 percent faint strong brown (7.5YR 5/6) clay films on faces of peds; 2 percent fine gravel and 1 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
- Cb—164 to 180 centimeters (64 to 71 inches); brownish yellow (10YR 6/6) loamy sand, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable; nonsticky and nonplastic; 1 percent fine gravel; slightly effervescent; moderately alkaline (pH 8.2).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 1 to 65 percent gravel

*Control section:*

Rock fragments—1 to 15 percent gravel

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of an argillic horizon—100 to 125 centimeters (40 to 50 inches)

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### *A horizon:*

Hue—10YR or 2.5Y  
Value—5 to 7 dry; 3 to 6 moist  
Chroma—2 to 4 dry; 3 or 4 moist  
Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand  
Clay content—1 to 6 percent  
Rock fragments—1 to 15 percent gravel  
Effervescence—noneffervescent or very slightly effervescent  
Reaction—neutral to moderately alkaline  
Other features—some pedons are characterized by vesicular pores in this horizon

### *C horizon:*

Hue—10YR or 2.5Y  
Value—5 to 7 dry; 3 to 5 moist  
Chroma—3 to 6, dry or moist  
Texture of the fine-earth fraction—sand, loamy coarse sand, or loamy sand  
Clay content—1 to 6 percent  
Rock fragments—1 to 30 percent gravel  
Effervescence—noneffervescent to strongly effervescent  
Reaction—slightly alkaline or moderately alkaline

### *Btb or Btkb horizon:*

Hue—7.5YR or 10YR  
Value—4 to 6 dry; 4 or 5 moist  
Chroma—4 to 6, dry or moist  
Texture of the fine-earth fraction—sandy loam or sandy clay loam  
Clay content—16 to 28 percent; average of 18 to 28 percent  
Rock fragments—1 to 15 percent gravel  
Effervescence—very slightly to violently effervescent  
Calcium carbonate equivalent—0 to 7 percent  
Reaction—moderately alkaline or strongly alkaline  
Silica—0 to 10 percent as coats on faces of peds and 0 to 4 percent as durinodes in the matrix  
Note—the Btb and Btkb horizons do not ever meet the requirements for a calcic horizon because they do not have a high enough calcium carbonate equivalent and/or do not have enough visible secondary carbonates

### *Cb horizon (if it occurs):*

Hue—7.5YR or 10YR  
Value—5 or 6 dry; 4 or 5 moist  
Chroma—4 to 6, dry or moist  
Texture of the fine-earth fraction—loamy coarse sand or loamy sand  
Clay content—4 to 8 percent  
Rock fragments—1 to 10 percent gravel  
Effervescence—very slightly or slightly effervescent  
Calcium carbonate equivalent—0 to 5 percent  
Reaction—slightly alkaline or moderately alkaline

## Joshua Series

The Joshua series consists of moderately deep, well drained soils that formed in material derived from mixed sources. Joshua soils are on old terraces with a well developed erosion pavement. Slopes range from 4 to 8 percent. The mean annual precipitation is about 138 millimeters (about 5.5 inches), and the mean annual air temperature is about 17 degrees C (63 degrees F).



### Taxonomic Classification

Fine-loamy, mixed, superactive, thermic Argidic Argidurids

### Typical Pedon

Joshua loam; San Bernardino County, California; on a 3 percent slope under creosote bush and burrobush, south of Helendale, 2 miles east of Bryman Road, 100 feet west of the gas pipeline maintenance trail; in the NE1/4 NW1/4 section 28, T. 7 N., R. 4 W., San Bernardino Base and Meridian; at an elevation of 2,960 feet; USGS Helendale, California 7.5 minute topographic quadrangle. The soil surface is covered with a well developed, varnished desert pavement consisting of rounded to subangular gravel and cobbles. (When described, the soil was dry throughout.)

- A—0 to 3 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; moderate very thin platy structure; slightly hard, very friable; slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; slightly effervescent with disseminated lime; slightly alkaline (pH 7.8); abrupt smooth boundary. (2 to 4 inches thick)
- Bt1—3 to 6 inches; brown (7.5YR 5/4) gravelly sandy clay loam, dark brown (7.5YR 4/4) moist; moderate very fine subangular blocky structure; slight hard, very friable; slightly sticky and slightly plastic; common very fine roots; few very fine interstitial pores; few moderately thick clay films on peds and many moderately thick clay films as bridges between mineral grains; 15 to 20 percent gravel ( $1/2$  to  $3/4$  inch in diameter); slightly alkaline (pH 7.8); clear smooth boundary. (1 to 7 inches thick)
- Bt2—6 to 13 inches; reddish brown (5YR 5/4) gravelly sandy clay loam, reddish brown (5YR 4/4) moist; moderate very fine subangular blocky structure; hard, firm; sticky and plastic; few very fine roots; few very fine interstitial pores; few moderately thick clay films on faces of peds and common moderately thick clay films in pores and as bridges between mineral grains; about 25 to 30 percent gravel; slightly alkaline (pH 7.8); gradual smooth boundary. (3 to 11 inches thick)
- Bt3—13 to 20 inches; reddish brown (5YR 5/4) gravelly sandy loam, reddish brown (5YR 4/4) moist; moderate medium angular blocky structure; hard, firm; sticky and plastic; few very fine roots; few very fine interstitial pores; few moderately thick clay films on peds and as bridges between mineral grains and common moderately thick clay films lining pores; about 25 to 30 percent gravel; slightly alkaline (pH 7.8); diffuse smooth boundary. (7 to 18 inches thick)
- BCKq—20 to 39 inches; white (10YR 8/2) very gravelly coarse sandy loam, light gray (10YR 7/2) moist; massive; slightly hard, friable; nonsticky and nonplastic; discontinuous white (10YR 8/2) silica lenses  $1/2$  to  $3/4$  inch wide and 1 to 2 millimeters thick; about 35 to 50 percent gravel; strongly effervescent with disseminated lime; moderately alkaline (pH 8.0); clear wavy boundary. (10 to 20 inches thick)
- Ckq—39 to 55 inches; white (10YR 8/2) duripan that crushes to very gravelly loamy coarse sand, very pale brown (10YR 7/3) moist; massive; very hard and firm matrix, extremely hard and extremely firm silica lenses; about 35 to 50 percent gravel; strongly effervescent with disseminated lime; moderately alkaline (pH 8.4).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days cumulative from July to September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 18 to 22 degrees C (64 to 72 degrees F)

*Depth to duripan:* 50 to 100 centimeters (20 to 40 inches)

*A horizon:*

Value—6 or 7 dry; 4 to 6 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—sandy loam or loam  
Rock fragments—3 to 14 percent gravel  
Reaction—slightly alkaline or moderately alkaline  
Effervescence—noneffervescent to slightly effervescent

*Bt horizon:*

Hue—5YR or 7.5YR, dry or moist  
Value—4 or 5, dry or moist  
Chroma—4 or 6, dry or moist  
Texture of the fine-earth fraction—sandy loam or sandy clay loam  
Clay content—average of 18 to 30 percent  
Rock fragments—15 to 35 percent gravel  
Reaction—slightly alkaline or moderately alkaline

*BCkq horizon (if it occurs):*

Value—7 or 8 dry; 6 or 7 moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—loamy coarse sand or coarse sandy loam  
Rock fragments—35 to 60 percent gravel

*Bkq or Ckq horizon:*

Value—7 or 8 dry; 6 or 7 moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—loamy coarse sand or coarse sandy loam  
Rock fragments—15 to 30 percent gravel  
Cementation—more than 50 percent of the horizon

## Jumborox Series

The Jumborox series consists of very deep, well drained soils that formed in alluvium derived from granite, granitoid, or gneissic rocks. Jumborox soils are on fan remnants. Slopes range from 2 to 15 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is about 15 degrees C (59 degrees F).

### Taxonomic Classification

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

### Typical Pedon

Jumborox sand (fig. 75); San Bernardino County, California (in Joshua Tree National Park); on a linear, 2 percent slope, approximately 1 kilometer south of the intersection of Lost Horse Mine Road and Keys View Road and 215 meters east of Keys View Road; approximately 349 meters north and 431 meters east of the southwest corner of section 32, T. 2 S., R. 8 E., San Bernardino Base and Meridian; at an elevation of 1,386 meters (4,545 feet); lat. 33 degrees 56 minutes 59.4 seconds N. and long. 116 degrees 10 minutes 15.3 seconds W.; USGS Keys View 7.5 minute topographic quadrangle; UTM 11S 576610e 3756903n (DTM: NAD83). The surface is covered by approximately 10 percent fine gravel and 5 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 centimeters (0 to 1 inch); light olive brown (2.5Y 5/3) sand, dark olive brown (2.5Y 3/3) moist; weak very fine subangular blocky structure parting to single grain;



Figure 75.—The Jumborox series type location. (Scale is in centimeters.)

soft, very friable; nonsticky and nonplastic; common very fine roots throughout; 1 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.6); clear wavy boundary.

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- A2—3 to 10 centimeters (1 to 4 inches); brown (10YR 5/3) loamy sand, dark brown (10YR 3/3) moist; weak coarse subangular blocky structure; soft, very friable; nonsticky and nonplastic; many very fine and very few fine roots throughout; common fine interstitial pores; 1 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.6); abrupt smooth boundary. (3 to 25 centimeters thick)
- Bt1—10 to 35 centimeters (4 to 14 inches); yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, very friable; slightly sticky and nonplastic; common fine and few medium and coarse roots throughout; common very fine interstitial and fine dendritic tubular pores; 10 percent faint yellowish brown (10YR 5/4) clay bridges between sand grains; 1 percent fine gravel; slightly alkaline (pH 7.6); clear wavy boundary.
- Bt2—35 to 55 centimeters (14 to 22 inches); dark yellowish brown (10YR 4/4) sandy loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, very friable; slightly sticky and nonplastic; common very fine and medium roots throughout; common very fine dendritic tubular and medium tubular pores; 15 percent distinct dark yellowish brown (10YR 4/6) clay films on surfaces along pores and 20 percent faint dark yellowish brown (10YR 4/4) clay bridges between sand grains; slightly alkaline (pH 7.7); clear wavy boundary.
- Bt3—55 to 93 centimeters (22 to 37 inches); dark yellowish brown (10YR 4/4) loamy sand, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, very friable; slightly sticky and nonplastic; many very fine and common medium roots throughout; common fine dendritic tubular and very fine interstitial pores; 3 percent faint dark yellowish brown (10YR 4/6) clay films on faces of peds and 20 percent faint dark yellowish brown (10YR 4/4) clay bridges between sand grains; 1 percent fine gravel; slightly alkaline (pH 7.7); clear wavy boundary. (Combined thickness of the Bt horizons is 25 to 130 centimeters)
- BtCt—93 to 180 centimeters (37 to 71 inches); yellowish brown (10YR 5/4) loamy sand, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; 5 percent strong brown (7.5YR 5/6) clay bridges between sand grains; 2 percent fine gravel; moderately alkaline (pH 8.0).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 15 to 19 degrees C

*Surface rock fragments:* 5 to 79 percent; including 5 to 70 percent fine gravel, 0 to 40 percent medium and coarse gravel, and 0 to 3 percent cobbles

#### *Control section:*

Rock fragments—1 to 20 percent; dominantly gravel

Organic matter content—0 to 0.5 percent

Clay content—8 to 18 percent

Depth to an argillic horizon—3 to 25 centimeters (1 to 10 inches)

#### *A horizon:*

Hue—2.5Y or 10YR

Value—4 to 6 dry; 3 to 5 moist

Chroma—3 to 6, dry or moist

Texture of the fine-earth fraction—sand, loamy sand, sandy loam, or fine sandy loam

Clay content—2 to 10 percent

Rock fragments—1 to 25 percent; dominantly fine gravel

Effervescence—noneffervescent or very slightly effervescent

Reaction—slightly acid to slightly alkaline

*Bw and/or BA horizon(s) (if they occur):*

Value—4 or 5 dry; 3 or 4 moist

Chroma—3 to 4, dry or moist

Texture of the fine-earth fraction—sand, loamy sand, or sandy loam

Clay content—2 to 8 percent

Rock fragments—3 to 7 percent; dominantly fine gravel

Reaction—neutral or slightly alkaline

*Bt or Btk horizon:*

Hue—10YR or 7.5YR

Value—4 or 5 dry; 3 to 5 moist

Chroma—3 to 6, dry or moist

Texture of the fine-earth fraction—loamy sand, coarse sandy loam, or sandy loam

Clay content—6 to 18 percent

Rock fragments—1 to 25 percent; dominantly gravel

Reaction—neutral to moderately alkaline

Note—secondary carbonates occur below a depth of 40 centimeters in some pedons

*BC or BCt horizon(s) (if they occur):*

Hue—7.5YR or 10YR

Value—4 to 6 dry; 3 to 5 moist

Chroma—4 or 6 dry; 3 or 4 moist

Texture of the fine-earth fraction—loamy coarse sand or loamy sand

Clay content—2 to 8 percent

Rock fragments—2 to 30 percent; dominantly fine gravel

Reaction—slightly alkaline or moderately alkaline

*C or Ck horizon (if it occurs):*

Hue—7.5YR or 10YR

Value—4 to 6 dry; 3 to 5 moist

Chroma—4 to 6 dry; 3 to 5 moist

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, or loamy sand

Clay content—2 to 8 percent

Rock fragments—5 to 20 percent; dominantly fine gravel

Effervescence—slightly to strongly effervescent

Reaction—neutral to moderately alkaline

## Kenalduma Series

The Kenalduma series consists of shallow and very shallow, well drained soils that formed in alluvium from granitoid or gneiss rock. Kenalduma soils are on fan remnants. Slopes range from 1 to 15 percent. The mean annual precipitation is about 75 millimeters (3 inches), and the mean annual air temperature is about 25 degrees C (77 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids



### Typical Pedon

Kenalduma very gravelly fine sandy loam; Riverside County, California; on an east-facing, linear, 2 percent slope under sparse desert shrubs, approximately 1.6 kilometers (1 mile) north-northeast of the junction of Kaiser and MWD Aqueduct Roads; 6 meters (20 feet) west and 650 meters (2,131 feet) south of the northeast corner of section 6, T. 4 S., R. 15 E., San Bernardino Base and Meridian; at an elevation of 290 meters (951 feet); lat. 33 degrees 51 minutes 12.5 seconds N. and long. 115 degrees 26 minutes 29.7 seconds W.; USGS Victory Pass 7.5 minute topographic quadrangle; UTM 11S 0644169e 3747003n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

- C—0 to 5 centimeters (0 to 2 inches); gravel; approximately 15 percent fine gravel, 63 percent medium and coarse gravel, 19 percent cobbles, and 1 percent stones; abrupt wavy boundary. (0 to 5 centimeters thick)
- Aq—5 to 10 centimeters (2 to 4 inches); light yellowish brown (10YR 6/4) very gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; moderate thick platy structure; slightly hard, very friable; nonsticky and slightly plastic; few very fine, fine, and medium vesicular pores; 10 percent medium prominent very pale brown (10YR 7/3) silica pendants on bottom of rock fragments; 15 percent fine gravel, 15 percent medium and coarse gravel, and 15 percent cobbles; violently effervescent; moderately alkaline (pH 8.3); clear wavy boundary. (2 to 5 centimeters thick)
- Bt—10 to 41 centimeters (4 to 16 inches); strong brown (7.5YR 4/6) very gravelly sandy loam, strong brown (7.5YR 4/6) moist; moderate fine and medium subangular blocky structure; slightly hard, friable; slightly sticky and slightly plastic; few very fine and fine and very few medium and coarse roots; 20 percent faint brown (7.5YR 4/4) clay films on faces of peds and 15 percent prominent brown (7.5YR 4/4) clay films on bottom of rock fragments; 25 percent fine gravel, 15 percent medium and coarse gravel, and 10 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (12 to 31 centimeters thick)
- Bkqm—41 to 67 centimeters (16 to 26 inches); white (7.5YR 8/1) weakly cemented gravelly sand, light yellowish brown (10YR 6/4) moist; duripan with 80 percent cementation; massive; moderately hard, brittle; nonsticky and nonplastic; 10 percent fine gravel, 5 percent medium and coarse gravel, and 10 percent cobbles; slightly effervescent; moderately alkaline (pH 8.1); clear wavy boundary.
- Bq—67 to 94 centimeters (26 to 37 inches); pale brown (10YR 6/3) very gravelly sand, light brownish gray (2.5Y 6/2) moist; single grain; loose; nonsticky and nonplastic; very few very fine and fine roots; 25 percent medium distinct very pale brown (10YR 7/3) silica pendants on bottom of rock fragments; 20 percent fine gravel, 30 percent medium and coarse gravel, and 1 percent cobbles; very slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.
- B'kq—94 to 152 centimeters (37 to 60 inches); white (7.5YR 8/1) weakly to moderately cemented sand, light yellowish brown (10YR 6/4) moist; duripan with 50 percent cementation; massive; moderately hard, brittle; nonsticky and nonplastic; 10 percent fine gravel and 5 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.0).

### Range in Characteristics

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some parts during winter, summer, and early fall; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (77 to 82 degrees F)

*Surface rock fragments:* 70 to 98 percent; including 8 to 30 percent fine gravel, 12 to 65 percent medium and coarse gravel, 5 to 35 percent cobbles, and 0 to 15 percent stones

*Control section:*

Depth to the upper boundary of an argillic horizon—5 to 16 centimeters (2 to 6 inches)  
Depth to the upper boundary of a duripan—18 to 50 centimeters (7 to 20 inches)  
Rock fragments—average of 35 to 50 percent; including 10 to 60 percent gravel, 0 to 15 percent cobbles, and 0 to 1 percent stones  
Clay content—ranging from 10 to 20 percent; average of 10 to 18 percent  
Organic matter content—0 to 0.25 percent

*C horizon (if it occurs):*

Rock fragments—85 to 98 percent gravel, cobbles, and stones

*Aq horizon:*

Value—4 or 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—sandy loam or fine sandy loam  
Clay content—6 to 15 percent  
Rock fragments—7 to 75 percent; including 7 to 60 percent gravel, 0 to 15 percent cobbles, and 0 to 1 percent stones  
Calcium carbonate equivalent—0 to 5 percent  
Effervescence—very slightly to violently effervescent  
Reaction—slightly alkaline or moderately alkaline

*Bt horizon:*

Hue—5YR or 7.5YR  
Value—4 to 6 dry; 4 or 5 moist  
Chroma—3 to 6 dry; 4 to 6 moist  
Texture of the fine-earth fraction—coarse sandy loam, sandy loam, or loam  
Clay content—10 to 18 percent  
Rock fragments—30 to 51 percent; including 30 to 40 percent gravel, 0 to 10 percent cobbles, and 0 to 1 percent stones  
Effervescence—very slightly to violently effervescent  
Reaction—slightly alkaline or moderately alkaline  
Calcium carbonate equivalent—0 to 10 percent  
Other features—0 to 25 percent silica pendants and 0 to 10 percent calcium carbonate coats on rock fragments

*Bkq or Bq horizon:*

Hue—7.5YR, 10YR, or 2.5Y  
Value—5 to 8 dry; 5 or 6 moist  
Chroma—1 to 6 dry; 4 to 6 moist  
Texture of the fine-earth fraction—coarse sand, sand, loamy sand, or sandy loam  
Clay content—1 to 12 percent  
Rock fragments—15 to 60 percent; including 15 to 50 percent gravel and 0 to 10 percent cobbles  
Effervescence—very slightly to violently effervescent  
Reaction—slightly alkaline or moderately alkaline  
Calcium carbonate equivalent—0 to 10 percent  
Other features—0 to 10 percent silica pendants and 0 to 10 percent carbonate coats on rock fragments

## Langwell Series

The Langwell series consists of very shallow and shallow, somewhat excessively drained soils that formed in granitic or metamorphic residuum. Langwell soils are on mountains, hills, and pediments. Slope ranges from 2 to 50 percent. The mean annual

precipitation is about 5 inches, and the mean annual temperature is about 66 degrees F.

### **Taxonomic Classification**

Loamy, mixed, superactive, calcareous, thermic Lithic Torriorthents

### **Typical Pedon**

Langwell gravelly loam; San Bernardino County, California; 900 feet east and 1,000 feet north of the southwest corner of sec. 21, T. 14 N., R. 3 E.; lat. 35 degrees 17 minutes 20 seconds N. and long. 116 degrees 40 minutes 25.5 seconds W.; Fort Irwin topographic quadrangle; UTM 11S, 0529650e 3905930n. The soil surface is covered by 30 percent gravel, 20 percent cobbles, and 5 percent stones. (Colors are for dry soil unless otherwise noted.)

A—0 to 1 inch; pale brown (10YR 6/3) gravelly loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, friable; slightly sticky and slightly plastic; few very fine and fine roots throughout; strongly effervescent; 25 percent gravel and 5 percent cobbles; slightly alkaline (pH 7.6); abrupt wavy boundary. (1 to 4 inches thick)

C—1 to 6 inches; light yellowish brown (10YR 6/4) gravelly loam, brown (10YR 4/3) moist; massive; soft, friable; slightly sticky and slightly plastic; few very fine and fine roots throughout; strongly effervescent; 20 percent gravel and 5 percent cobbles; slightly alkaline (pH 7.8); clear irregular boundary. (3 to 10 inches thick)

R—6 inches; unweathered and fractured granitic bedrock; pockets of weathered bedrock material with moderate to high excavation difficulty.

### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 63 to 72 degrees F

*Organic matter content:* 0 to 0.5 percent

*Depth to bedrock:* 4 to 14 inches

*Surface rock fragments:* 10 to 65 percent gravel, 0 to 40 percent cobbles, and 0 to 15 percent stones

*Note:* Some pedons have a thin, weak Bw horizon with characteristics similar to those of the A horizon

#### *Control section:*

Clay content—8 to 20 percent

Texture of the fine-earth fraction—sandy loam or loam

Rock fragments—10 to 30 percent

#### *A horizon:*

Hue—10YR or 2.5Y

Value—5 to 7 dry; 4 or 5 moist

Chroma—2 to 4, dry or moist

Rock fragments—35 to 60 percent; including 10 to 60 percent gravel, 0 to 30 percent cobbles, and 0 to 5 percent stones

Reaction—slightly alkaline or moderately alkaline

#### *C horizon:*

Hue—10YR or 2.5Y

Value—5 to 7 dry; 4 or 5 moist

Chroma—2 to 4, dry or moist

Rock fragments—10 to 30 percent; including 10 to 30 percent gravel and 0 to 10 percent cobbles

Reaction—slightly alkaline or moderately alkaline

*R layer:*

Bedrock—unweathered, slightly to highly fractured granitic bedrock that has pockets of slightly to moderately weathered bedrock material with moderate to extremely high excavation difficulty

## Littlefargo Series

The Littlefargo series consists of moderately deep, well drained soils that formed in colluvium derived from granitoid over residuum weathered from granitoid. Littlefargo soils are on hills and pediments. Slopes range from 4 to 15 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 15 degrees C (59 degrees F).

### Taxonomic Classification

Coarse-loamy, mixed, superactive, thermic Typic Haplargids

### Typical Pedon

Littlefargo loamy sand; Riverside County, California; approximately 1.4 kilometers north of Juniper Flats Road in Joshua Tree National Park; approximately 505 meters north and 235 meters west of the southeast corner of sec. 24, T. 2 S., R. 7 E, San Bernardino Base and Meridian; lat. 33 degrees 58 minutes 50.2 seconds N. and long. 116 degrees 11 minutes 54.6 seconds W.; USGS Keys View 7.5 minute topographic quadrangle; UTM 11S 574035e 3760296n (DATUM: NAD83). The soil surface is covered by 55 percent fine gravel and 5 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

A1—0 to 3 centimeters (0 to 1 inch); light yellowish brown (10YR 6/4) loamy sand, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common fine interstitial pores; 5 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.4); clear wavy boundary.

A2—3 to 10 centimeters (1 to 4 inches); brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common fine interstitial pores; 6 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.4); clear smooth boundary. (Combined thickness of A horizons is 10 to 20 centimeters)

Bt1—10 to 23 centimeters (4 to 9 inches); yellowish brown (10YR 5/4) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very friable; slightly sticky and nonplastic; common very fine roots; common fine interstitial pores; 5 percent faint yellowish brown (10YR 5/4) clay bridges between sand grains; 6 percent fine gravel; neutral (pH 7.2); clear wavy boundary.

Bt2—23 to 43 centimeters (9 to 17 inches); dark yellowish brown (10YR 4/4) sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable; slightly sticky and nonplastic; few fine, few medium, and common very fine roots; few fine tubular and common fine interstitial pores; 35 percent faint dark yellowish brown (10YR 4/4) clay bridges between sand grains; 5 percent fine gravel; neutral (pH 7.0); gradual wavy boundary.

Bt3—43 to 79 centimeters (17 to 31 inches); yellowish brown (10YR 5/4) coarse sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky

structure; slightly hard, very friable; slightly sticky and nonplastic; few very fine roots; common fine interstitial and common very fine tubular pores; 25 percent faint yellowish brown (10YR 5/4) clay bridges between sand grains; 5 percent fine gravel and 1 percent medium and coarse gravel; neutral (pH 7.2); clear wavy boundary. (Combined thickness of Bt horizons is 24 to 69 centimeters)

B<sub>Ct</sub>—79 to 86 centimeters (31 to 34 inches); yellowish brown (10YR 5/6) sandy loam, dark yellowish brown (10YR 3/4) moist; massive; hard, very friable; slightly sticky and nonplastic; few very fine roots; common fine interstitial pores; 15 percent faint yellowish brown (10YR 5/6) clay bridges between sand grains; 9 percent fine gravel; slightly alkaline (pH 7.4); gradual wavy boundary. (7 to 27 centimeters thick)

C<sub>rt</sub>—86 to 150 centimeters (34 to 60 inches); moderately weathered, granitoid bedrock; 60 percent distinct strong brown (7.5YR 5/8) clay films on surfaces of rock fragments.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 15 to 19 degrees C

#### *Control section:*

Rock fragments—5 to 20 percent; dominantly gravel

Clay content—8 to 15 percent

Effervescent—noneffervescent throughout the section

Depth to argillic horizon—10 to 25 centimeters (4 to 10 inches)

Depth to paralithic contact—50 to 100 centimeters (20 to 40 inches)

#### *A horizon:*

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—loamy sand or sandy loam

Clay content—3 to 10 percent

Reaction—neutral or slightly alkaline

Rock fragments—5 to 8 percent gravel

#### *Bt horizons:*

Value—4 to 6 dry; 3 to 6 moist

Chroma—3 or 4 dry; 3, 4, or 6 moist

Texture of the fine-earth fraction—coarse sandy loam or sandy loam

Clay content—8 to 18 percent

Reaction—neutral or slightly alkaline

Rock fragments—5 to 20 percent; dominantly gravel

Note—some pedons have up to 45 percent rock fragments in the upper part of the argillic horizon

#### *B<sub>Ct</sub> or C horizon:*

Value—4 or 5 dry

Chroma—4 or 6 dry

Texture of the fine-earth fraction—loamy sand or sandy loam

Clay content—6 to 12 percent

Reaction—neutral to slightly alkaline

Rock fragments—0 to 10 percent



## Lostpalms Series

The Lostpalms series consists of very shallow and shallow, somewhat excessively drained soils that formed in residuum from granitoid rocks. Lostpalm soils are on hills and pediments. Slopes range from 8 to 50 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Sandy-skeletal, mixed, thermic Lithic Torriorthents

### Typical Pedon

Lostpalms gravelly loamy fine sand; Riverside County, California; on a west-facing, convex, 50 percent slope under desert shrubs, approximately 1.9 kilometers south-southwest of the junctions of Pinto Basin Road, Blackeagle Road, and Old Dale Road in Joshua Tree National Park; 486 meters (1,594 feet) south and 715 meters (2,345 feet) east of the northwest corner of section 19, T. 4 S., R. 12 E., San Bernardino Base and Meridian; at an elevation of 832 meters (2,729 feet); lat. 33 degrees 48 minutes 41.2 seconds N. and long. 115 degrees 45 minutes 55.6 seconds W.; USGS Porcupine Wash 7.5 minute topographic quadrangle; UTM 11S 613968e 3745357n (DTM: NAD83). The surface is covered by approximately 20 percent fine gravel, 15 percent medium and coarse gravel, 25 percent cobbles, 10 percent stones, and 5 percent boulders. (Colors are for dry soil unless otherwise noted.)

- A—0 to 2 centimeters (0 to 1 inch); brown (10YR 5/3) gravelly loamy fine sand, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; very few very fine roots; 10 percent fine gravel, 5 percent medium and coarse gravel, and 5 percent cobbles; slightly alkaline (pH 7.6); abrupt wavy boundary. (1 to 3 centimeters thick)
- C—2 to 19 centimeters (1 to 7 inches); brown (10YR 5/3) very cobbly loamy fine sand, brown (10YR 4/3) moist; massive; soft, very friable; nonsticky and nonplastic; common very fine, few fine, and very few medium and coarse roots; 7 percent fine gravel, 8 percent medium and coarse gravel, and 25 percent cobbles; slightly alkaline (pH 7.8); very abrupt wavy boundary. (4 to 32 centimeters thick)
- R—19 centimeters (7 inches); slightly weathered, unfractured granitoid bedrock.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Depth to a lithic contact:* 5 to 35 centimeters (2 to 14 inches)

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 75 to 95 percent; including 15 to 40 percent fine gravel, 15 to 30 percent medium and coarse gravel, 10 to 40 percent cobbles, 5 to 10 percent stones, and 0 to 10 percent boulders

*Control section:*

Clay content—5 to 10 percent

Rock fragments—35 to 60 percent; dominantly gravel and cobbles

*C horizon (if it occurs) above A horizon:*

Rock fragments—85 to 95 percent gravel, cobbles, stones, and boulders

*A horizon:*

Value—5 or 6 dry; 3 or 4 moist

Chroma—2 or 3, dry or moist

Texture of the fine-earth fraction—loamy sand or loamy fine sand

Clay content—3 to 10 percent

Rock fragments—15 to 34 percent; including 15 to 30 percent gravel and 0 to 10 percent cobbles

Effervescence—very slightly or slightly effervescent

Reaction—neutral or slightly alkaline

*C or C' horizon:*

Value—5 or 6 dry

Chroma—3 or 4 dry

Texture of the fine-earth fraction—loamy sand or loamy fine sand

Clay content—3 to 10 percent

Rock fragments—35 to 55 percent; including 15 to 30 percent gravel and 5 to 25 percent cobbles

Effervescence—slightly to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

## Marbolite Series

The Marbolite series consists of shallow, well drained soils that formed in residuum from granitoid or gneissic rocks. Marbolite soils are on pediments, hills, and mountains. Slopes range from 2 to 75 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplargids

### Typical Pedon

Marbolite cobbles; Riverside County, California; on a north-facing, linear, 60 percent slope under desert shrubs, approximately 125 meters east-southeast from the end of MWD Powerline Road; 375 meters (1,230 feet) north and 30 meters (98 feet) west of the southeast corner of section 19, T. 3 S., R. 16 E., San Bernardino Base and Meridian; at an elevation of 537 meters (1,761 feet); lat. 33 degrees 53 minutes 27.7 seconds N. and long. 115 degrees 19 minutes 57.1 seconds W.; USGS Coxcomb Mountains 7.5 minute topographic quadrangle; UTM 11S 0654193e 3751326n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 18 centimeters (0 to 7 inches); cobbles; 10 percent fine gravel, 15 percent medium and coarse gravel, 50 percent cobbles, and 20 percent stones; abrupt wavy boundary. (15 to 26 centimeters thick)

A—18 to 22 centimeters (7 to 8.5 inches); pale brown (10YR 6/3) extremely cobbly loamy sand, olive brown (2.5Y 4/3) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine and fine roots; few fine vesicular and very few fine tubular pores; 15 percent fine gravel, 15 percent medium and coarse gravel, 35 percent cobbles, and 5 percent stones; very slightly effervescent; neutral (pH 6.8); clear wavy boundary. (2 to 6 centimeters thick)

Bt—22 to 46 centimeters (8.5 to 18 inches); light yellowish brown (10YR 6/4) very gravelly loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable; slightly sticky and slightly plastic; few very fine and medium, common fine, and very few coarse roots; 10 percent faint yellowish brown (10YR 5/4) clay films on faces of peds; 15 percent fine gravel, 20 percent medium

and coarse gravel, and 20 percent cobbles; violently effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (8 to 30 centimeters thick)  
R—46 centimeters (18 inches); unweathered, slightly fractured granitoid bedrock.

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 80 to 100 percent; including 10 to 15 percent fine gravel, 10 to 20 percent medium and coarse gravel, 20 to 50 percent cobbles, 15 to 35 percent stones, and 0 to 10 percent boulders

*Control section:*

Rock fragments—35 to 75 percent gravel, cobbles, and stones

Clay content—average of 10 to 18 percent

Organic matter content—0 to 0.25 percent

Depth to the upper boundary of an argillic horizon—17 to 32 centimeters (6.5 to 13 inches)

Depth to a lithic contact—36 to 50 centimeters (14 to 20 inches)

*C horizon:*

In lieu of texture—cobbles or stones

Rock fragments—80 to 100 percent; including 20 to 70 percent gravel, 5 to 50 percent cobbles, and 5 to 40 percent stones and boulders

*A horizon:*

Hue—10YR or 2.5Y

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy sand or sandy loam

Clay content—4 to 10 percent

Rock fragments—30 to 70 percent; including 20 to 35 percent gravel, 10 to 35 percent cobbles, and 0 to 5 percent stones

Effervescence—noneffervescent or very slightly effervescent

Calcium carbonate equivalent—0 to 1 percent

Reaction—neutral to moderately alkaline

*Bt horizon:*

Hue—10YR or 7.5YR

Value—5 or 6 dry; 3 to 5 moist

Chroma—4 to 6 dry; 3 to 6 moist

Texture of the fine-earth fraction—sandy loam, fine sandy loam, or loam

Clay content—10 to 18 percent

Rock fragments—35 to 75 percent; including 25 to 55 percent gravel, 10 to 25 percent cobbles, and 0 to 5 percent stones

Effervescence—very slightly to violently effervescent

Calcium carbonate equivalent—0 to 1 percent

Reaction—neutral to moderately alkaline

## **Marsite Series**

The Marsite series consists of shallow and very shallow, somewhat excessively drained soils that formed in residuum and colluvium from basalt, andesite, or rhyolite. Marsite soils are on hills and mountains. Slopes range from 8 to 30 percent. The mean

annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18 degrees C (64 degrees F).

**Taxonomic Classification**

Loamy-skeletal, mixed, superactive, thermic, shallow Typic Haplodurids

**Typical Pedon**

Marsite-Haleburu complex, 15 to 50 percent slopes; San Bernardino County, California; about 2,850 feet east and 1,500 feet north of the southwest corner of section 31, T. 15 N., R. 1 E.; at an elevation of 3,429 feet; lat. 35 degrees 21 minutes 07 seconds N. and long. 116 degrees 55 minutes 02 seconds W.; USGS Goldstone 7.5 minute topographic quadrangle; UTM 11S 0507523e 3911876n (DTM: NAS-C). The surface is covered by 50 percent gravel, 35 percent cobbles, and 5 percent stones. (Colors are for dry soil unless otherwise noted.)

A1—0 to 5 centimeters (0 to 2 inches); pale brown (10YR 6/3) extremely cobbly loam, brown (10YR 4/3) moist; moderate thick platy structure; slightly hard, very friable; nonsticky and nonplastic; common very fine and few fine roots throughout; many very fine vesicular and few very fine and fine tubular pores; noneffervescent; 50 percent gravel, 35 percent cobbles, and 5 percent stones; slightly alkaline (pH 7.8); clear smooth boundary.

A2—5 to 20 centimeters (2 to 8 inches); pale brown (10YR 6/3) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; moderately hard, very friable; nonsticky and slightly plastic; common very fine and very few fine and medium roots throughout; few very fine and fine interstitial and tubular pores; strongly effervescent; 5 percent cobbles and 60 percent gravel; moderately alkaline (pH 8.2); abrupt smooth boundary. (Combined thickness of the A horizons is 2 to 8 inches)

Bqkm—20 to 38 centimeters (8 to 15 inches); very pale brown (10YR 7/3) moderately cemented duripan, light yellowish brown (10YR 6/4) moist; very hard, extremely firm, brittle; slightly fractured, thin ( $\frac{1}{8}$  to  $\frac{1}{4}$  inch thick) laminar cap; few very fine and fine roots in cracks; violently effervescent.

R—38 centimeters (15 inches); hard, slightly fractured rhyolite.

**Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 63 to 68 degrees F

*Surface rock fragments:* 60 to 90 percent gravel, cobbles, and stones

*Control section:*

Rock fragments—50 to 90 percent

Clay content—8 to 12 percent

Organic matter content—0 to 0.5 percent

Depth to duripan—4 to 14 inches

Depth to bedrock—6 to 20 inches

*A horizon:*

Value—6 or 7 dry; 3 to 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—fine sandy loam, sandy loam, or loam

Effervescence—noneffervescent to strongly effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline to strongly alkaline

*Bkqm horizon:*

Value—6 to 8, dry or moist

Chroma—1 to 4, dry or moist

Effervescence—strongly or violently effervescent

## Meccapass Series

The Meccapass series consists of moderately deep, well drained soils that formed in colluvium and residuum derived from gneiss, granite, and/or other granitoid rocks. Meccapass soils are on mountains. Slopes range from 15 to 75 percent. The mean annual precipitation is 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocambids

### Typical Pedon

Meccapass gravel (fig. 76); Riverside County, California; on a linear, 44 percent slope under desert shrubs, about 800 meters north-northeast of the intersection of Edison Powerline Road and I-10 Frontage Road and about 610 meters due north of Edison Powerline Road; about 755 meters west and 675 meters north of the southeast corner of section 2, T. 6 S., R. 10 E., San Bernardino Base and Meridian; at an elevation of 483 meters (1,585 feet); lat. 33 degrees 40 minutes 40.0 seconds N. and long. 115 degrees 54 minutes 52.8 seconds W.; USGS Cottonwood Basin 7.5 minute topographic quadrangle; UTM 11S 0600605e 3726960n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

- C—0 to 5 centimeters (0 to 2 inches); gravel; 10 percent fine gravel, 62 percent medium and coarse gravel, 20 percent cobbles, 2 percent stones, and 1 percent boulders. (2 to 15 centimeters thick)
- A—5 to 7 centimeters (2 to 3 inches); brown (10YR 5/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate very thick platy structure parting to moderate medium subangular blocky; slightly hard, friable; nonsticky and nonplastic; few very fine roots; common very fine irregular and common fine interstitial pores; 10 percent fine gravel, 20 percent medium and coarse gravel, and 5 percent cobbles; very slightly effervescent; slightly alkaline (pH 7.6); abrupt wavy boundary. (2 to 8 centimeters thick)
- Bk—7 to 41 centimeters (3 to 16 inches); pale brown (10YR 6/3) very gravelly loam, dark yellowish brown (10YR 3/4) moist; moderate fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common fine and very fine irregular pores; 7 percent prominent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; 20 percent fine gravel, 35 percent medium and fine gravel, and 4 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (32 to 67 centimeters thick)
- BCK—41 to 68 centimeters (16 to 27 inches); light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable; slightly sticky and nonplastic; common very fine roots in cracks; few very fine irregular pores; 12 percent prominent white (10YR 8/1) calcium carbonate coats on rock fragments; 12 percent fine gravel, 50 percent medium and coarse gravel, 10 percent medium and coarse paragravel, 3 percent cobbles, and 3 percent paracobbles; violently effervescent; moderately alkaline (pH 8); clear wavy boundary. (0 to 52 centimeters thick)
- Crk—68 to 150 centimeters (27 to 60 inches); moderately cemented, moderately weathered, fractured granitoid bedrock; fractures are more than 10 centimeters





Figure 76.—The Meccapass series type location. (Scale is in centimeters.)

apart; high excavation difficulty; moderately few very fine roots in mat at top of horizon; 30 percent medium prominent irregular weakly cemented white (10YR 8/1) calcium carbonate masses with clear boundaries at top of horizon.

**Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (63 to 73 degrees F)

*Surface rock fragments:* 80 to 100 percent; including 5 to 55 percent fine gravel, 25 to 65 percent medium and coarse gravel, 15 to 50 percent cobbles, 1 to 10 percent stones, and 0 to 10 percent boulders

*Control section:*

Rock fragments—40 to 80 percent

Clay content—6 to 12 percent

Organic matter content—0 to 0.5 percent

Depth to paralithic contact—50 to 100 centimeters (20 to 40 inches)

*C horizon:*

Rock fragments—80 to 100 percent; including 5 to 55 percent fine gravel, 10 to 62 percent medium and coarse gravel, 8 to 50 cobbles, 0 to 10 percent stones, and 0 to 10 boulders

*A horizon:*

Hue—10YR or 2.5Y

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy fine sand, fine sandy loam, or sandy loam

Clay content—4 to 10 percent

Rock fragments—15 to 40 percent; including 15 to 35 gravel and 0 to 5 percent cobbles

Effervescence—noneffervescent to violently effervescent

Reaction—slightly alkaline or moderately alkaline

*Bk and/or Bw horizon(s):*

Hue—10YR or 2.5Y

Value—5 to 7 dry; 3 to 6 moist

Chroma—2 to 4 dry; 3 or 4 moist

Texture of the fine-earth fraction—loamy coarse sand, sandy loam, fine sandy loam, or loam

Clay content—6 to 18 percent

Rock fragments—15 to 100 percent; including 15 to 55 percent indurated gravel, 0 to 20 percent indurated cobbles, and 3 to 20 percent paragravel and paracobbles

Effervescence—very slightly to violently effervescent

Calcium carbonate equivalent—0 to 3 percent

Reaction—slightly alkaline or moderately alkaline

*B<sub>ck</sub>, B<sub>Ct</sub>, and/or C<sub>k</sub> horizons (if they occur):*

Hue—10YR or 2.5Y

Value—5 to 7 dry; 4 to 6 moist

Chroma—3 to 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—loamy coarse sand, coarse sandy loam, sandy loam, or loam

Clay content—6 to 14 percent

Rock fragments—3 to 100 percent; including 30 to 75 percent indurated gravel, 0 to 20 percent indurated cobbles, 0 to 5 percent stones, 0 to 25 percent paragravel, and 3 to 20 percent paracobbles

Effervescence—very slightly to violently effervescent

Calcium carbonate equivalent—0 to 3 percent

Reaction—slightly alkaline or moderately alkaline

## Mekkadale Series

The Mekkadale series consists of shallow, well drained soils that formed in alluvium from granitoid rocks. Mekkadale soils are on fan remnants. Slopes range from 4 to 30 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (64.5 degrees F).

### Taxonomic Classification

Loamy, mixed, superactive, thermic, shallow Argidic Argidurids

### Typical Pedon

Mekkadale loam; Riverside County, California; on a north-northwest-facing, convex, 16 percent slope under desert shrubs, approximately 415 meters (1,361 feet) west-northwest of the Cottonwood Visitor Center, near the junction of Pintobasin and Cottonwood Oasis Roads in Joshua Tree National Park; 592 meters (1,942 feet) east and 656 meters (2,151 feet) north of the southwest corner of section 9, T. 5 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 947 meters (3,106 feet); lat. 34 degrees 44 minutes 59.5 seconds N. and long. 115 degrees 49 minutes 41.8 seconds W.; USGS Cottonwood Springs 7.5 minute topographic quadrangle; UTM 11S 0608525e 3735037n (DTM: NAD83). The surface is covered by approximately 25 percent fine gravel, 45 percent medium and coarse gravel, and 10 percent cobbles. (Colors are for dry soil unless otherwise noted.)

A—0 to 3 centimeters (0 to 1 inch); yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable; slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine vesicular pores; 7 percent fine gravel and 3 percent medium and coarse gravel; slightly alkaline (pH 7.4); abrupt smooth boundary. (2 to 5 centimeters thick)

Bt—3 to 30 centimeters (1 to 12 inches); yellowish brown (10YR5/6) loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; moderately hard, friable; slightly sticky and moderately plastic; common very fine, few fine, and very few medium roots; few very fine and fine interstitial pores; 15 percent distinct brown (7.5YR 4/4) clay films on faces of peds; 6 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.4); clear wavy boundary.

Btk—30 to 47 centimeters (12 to 18 inches); dark yellowish brown (10YR 4/6) sandy loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; moderately hard, firm; slightly sticky and slightly plastic; very few medium roots; 20 percent faint yellowish brown (10YR 5/4) clay films on faces of peds; 3 percent fine prominent irregular soft very pale brown (10YR 8/2) calcium carbonate masses with clear boundaries in the matrix; 6 percent fine gravel and 4 percent medium and coarse gravel; very slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary. (Combined thickness of the Bt horizons is 25 to 47 centimeters)

Bkqm—47 to 66 centimeters (18 to 26 inches); pale brown (10YR 6/3) weakly to moderately cemented loamy sand, brown (10YR 4/3) moist; duripan with 95 percent cementation; massive; very hard, very firm, brittle; 5 percent fine prominent irregular hard very pale brown (10YR 8/2) calcium carbonate threads with clear boundaries in the matrix; 2 percent fine gravel and 1 percent medium

and coarse gravel; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (10 to 25 centimeters thick)

Ckq—66 to 150 centimeters (26 to 59 inches); very pale brown (10YR 7/3) gravelly loamy sand, brown (10YR 4/3) moist; massive; slightly hard, friable; nonsticky and nonplastic; 2 percent fine very pale brown (10YR 7/3) irregular durinodes in the matrix; 20 percent fine gravel and 10 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.2).

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 65 to 79 percent; including 10 to 30 percent fine gravel, 40 to 55 percent medium and coarse gravel, and 0 to 10 percent cobbles

#### *Control section:*

Clay content—average of 18 to 24 percent; ranging from 15 to 28 percent

Rock fragments—5 to 15 percent; dominantly gravel

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of an argillic horizon—2 to 5 centimeters (1 to 2 inches)

Depth to the upper boundary of a duripan—36 to 50 centimeters (14 to 20 inches)

#### *A horizon:*

Hue—7.5YR or 10YR

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 to 6 moist

Texture of the fine-earth fraction—loamy coarse sand or loam

Clay content—8 to 16 percent

Rock fragments—10 to 15 percent gravel

Effervescence—noneffervescent to violently effervescent

Reaction—slightly alkaline or moderately alkaline

Other features—vesicular pores occur in some pedons

#### *Bt or Btk horizon:*

Hue—7.5YR or 10YR

Value—4 or 5, dry or moist

Chroma—4 to 6, dry or moist

Texture of the fine-earth fraction—sandy loam or sandy clay loam

Clay content—15 to 28 percent

Rock fragments—5 to 15 percent gravel

Effervescence—noneffervescent to violently effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline to strongly alkaline

#### *Bkq, Bkqm, or Ckq horizon:*

Hue—7.5YR or 10YR

Value—5 to 8 dry; 3 to 7 moist

Chroma—2 to 4 dry; 3 to 6 moist

Clay content—3 to 12 percent

Texture of the fine-earth fraction—coarse sand, loamy sand, coarse sandy loam, or sandy loam

Rock fragments—1 to 30 percent gravel

Reaction—moderately alkaline to very strongly alkaline



Calcium carbonate equivalent—5 to 15 percent

Cementation—extremely weak to strong with 75 to 95 percent continuity

Silica—0 to 15 percent as durinodes

## Minhoyt Series

The Minhoyt series consists of very shallow, well drained soils that formed in alluvium from granitoid and gneiss. Minhoyt soils are on fan remnants. Slopes range from 2 to 15 percent. The mean annual precipitation is about 140 millimeters, and the mean annual air temperature is about 19 degrees C.

### Taxonomic Classification

Loamy, mixed, superactive, thermic, shallow Typic Haplodurids

### Typical Pedon

Minhoyt sandy loam; San Bernardino County, California; on a west-northwest-facing, linear, 4 percent slope under desert shrubs, approximately 1.5 kilometers east-northeast of the Cottonwood Visitor Center in Joshua Tree National Park; 500 meters south and 760 meters west of the northeast corner of section 11, T. 5 S., R. 11 E., San Bernardino Base Meridian; at an elevation of 970 meters (3,182 feet); lat. 33 degrees 45 minutes 14.0 seconds N. and long. 115 degrees 48 minutes 28.7 seconds W.; USGS Porcupine Wash, California 7.5 minute topographic quadrangle; UTM 11S 0610399e 3735507n (DTM: NAD83). The surface is covered by approximately 25 percent fine gravel, 5 percent medium gravel, 5 percent cobbles, 25 percent strongly cemented fine gravel-sized duripan fragments, 4 percent strongly cemented medium gravel-sized duripan fragments, and 1 percent strongly cemented cobble-sized duripan fragments. (Colors are for dry soil unless otherwise noted.)

Aq—0 to 2 centimeters (0 to 0.75 inch); pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; weak thick platy structure; soft, very friable; slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and few medium irregular pores; 10 percent distinct medium very pale brown (10YR 8/2) weakly cemented and 5 percent distinct medium very pale brown (10YR 8/2) strongly cemented irregular durinodes in the matrix with clear boundaries; 1 percent fine gravel and 4 percent medium and coarse gravel; violently effervescent (10 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 3 centimeters thick)

Bkq1—2 to 5 centimeters (0.75 inch to 2 inches); pale brown (10YR 6/3) gravelly loamy coarse sand, brown (10YR 5/3) moist; weak fine subangular blocky structure parting to massive; soft, very friable; nonsticky and nonplastic; common very fine and fine roots; few very fine and common fine interstitial pores; 8 percent distinct very pale brown (10YR 8/2) strongly cemented irregular durinodes in the matrix with clear boundaries; 30 percent faint white (10YR 8/1) calcium carbonate films on durinodes; 2 percent fine gravel and 10 percent medium and coarse gravel; violently effervescent (15 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); abrupt smooth boundary. (0 to 6 centimeters thick)

Bkq2—5 to 10 centimeters (2 to 4 inches); very pale brown (10YR 8/2) moderately cemented loamy coarse sand, pale brown (10YR 6/3) moist; duripan with 70 percent cementation; massive; very hard, extremely firm; nonsticky and nonplastic; few very fine and common fine irregular pores; 30 percent faint white (10YR 8/1) calcium carbonate films on duripan fragments; 3 percent fine gravel and 1 percent



medium and coarse gravel; violently effervescent (44 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); abrupt smooth boundary.

Bkq3—10 to 30 centimeters (4 to 12 inches); pale brown (10YR 6/3) strongly cemented loamy coarse sand, pale brown (10YR 6/3) moist; duripan with 80 percent cementation; massive; very hard, extremely firm; nonsticky and nonplastic; few medium and common fine and medium roots in cracks; 2 percent fine gravel and 1 percent medium and coarse gravel; violently effervescent (16 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); clear smooth boundary. (Combined thickness of the Bkq2 and Bkq3 horizons is 23 to 67 centimeters)

Bkqm—30 to 70 centimeters (12 to 28 inches); very strongly cemented (more than 90 percent cementation) duripan.

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and October following summer convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 60 to 70 percent; including 5 to 30 percent gravel, 0 to 5 percent cobbles, 0 to 65 percent strongly cemented gravel-sized duripan fragments, and 0 to 10 percent strongly cemented cobble-sized duripan fragments

*Depth to duripan:* 2 to 18 centimeters (0.75 inch to 7 inches)

#### *Control section:*

Rock fragments—5 to 15 percent; mainly gravel

Durinodes—5 to 25 percent; strongly cemented and fine gravel-sized

Clay content—8 to 12 percent

#### *Aq and/or A horizons:*

Value—4 or 5 moist

Chroma—3 or 4 moist

Texture of the fine-earth fraction—sandy loam or fine sandy loam

Clay content—10 to 15 percent

Rock fragments—1 to 14 percent gravel

Effervescence—slightly to violently effervescent

Calcium carbonate equivalent—5 to 15 percent

Durinodes—0 to 25 percent; weakly to strongly cemented and fine gravel-sized

#### *Bkq or Bkq1 horizon (if it occurs):*

Value—5 to 7 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sandy loam, loamy sand, loamy coarse sand, or loam

Clay content—4 to 15 percent

Rock fragments—5 to 15 percent gravel

Effervescence—strongly or violently effervescent

Calcium carbonate equivalent—5 to 15 percent

Durinodes—5 to 20 percent; moderately to strongly cemented and fine gravel-sized

#### *Bkq2 and/or Bkq3 horizons (if they occur):*

Value—7 or 8 dry; 5 or 6 moist

Chroma—2 or 3 dry; 3 or 4 moist

Texture of the fine-earth fraction (when crushed)—sand, coarse sand, or loamy coarse sand

Clay content—2 to 5 percent  
Rock fragments—1 to 5 percent gravel  
Calcium carbonate equivalent—16 to 44 percent  
Cementation—70 to 90 percent; moderately or strongly cemented

*Bkqm horizon:*

Cementation—very strongly cemented or indurated with more than 90 percent continuity

## Missionsweet Series

The Missionsweet series consists of shallow, well drained soils that formed in alluvium from igneous rock. Missionsweet soils are on side slopes of fan remnants. Slopes range from 8 to 30 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Cambidic Haplodurids

### Typical Pedon

Missionsweet very gravelly loam; Riverside County, California; on a north-northwest-facing, linear, 13 percent slope under desert shrubs, in Joshua Tree National Park; 310 meters (1,017 feet) west and 535 meters (1,754 feet) north of the southeast corner of section 33, T. 3 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 645 meters (2,115 feet); lat. 33 degrees 51 minutes 51.2 seconds N. and long. 115 degrees 37 minutes 12 seconds W.; USGS Buzzard Spring 7.5 minute topographic quadrangle; UTM 11S 0627646e 3747957n (DTM: NAD83). (Colors are for dry soil unless otherwise noted).

- C—0 to 5 centimeters (0 to 2 inches); gravel; approximately 75 percent gravel, 15 percent cobbles, and 1 percent stones. (2 to 5 centimeters thick)
- A—5 to 7 centimeters (2 to 3 inches); light yellowish brown (10YR 6/4) very gravelly loam, brown (10YR 4/3) moist; weak thin platy structure parting to weak fine subangular blocky; slightly hard, friable; slightly sticky and slightly plastic; common very fine roots; many very fine and fine tubular pores; 20 percent fine gravel, 15 percent medium and coarse gravel, and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 6 centimeters thick)
- Bk—7 to 28 centimeters (3 to 11 inches); light yellowish brown (10YR 6/4) extremely gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable; slightly sticky and slightly plastic; many very fine and fine and common medium roots; few fine tubular pores; 3 percent white (10YR 8/1) calcium carbonate threads throughout the matrix; 30 percent fine gravel, 20 percent medium and coarse gravel, and 12 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary.
- Bkq—28 to 43 centimeters (11 to 17 centimeters); pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable; nonsticky and nonplastic; few very fine and fine roots; few fine tubular pores; 30 percent white (10YR 8/1) very strongly cemented durinodes in the matrix; 25 percent fine gravel, 15 percent medium and coarse gravel, and 12 percent cobbles; violently effervescent; moderately alkaline (pH 8.0); abrupt irregular boundary. (Combined thickness of the Bk horizons is 23 to 39 centimeters)
- Bkqm—43 to 68 centimeters (17 to 27 inches); white (10YR 8/1) strongly cemented sandy loam, light gray (10YR 7/2) moist; duripan with 90 percent cementation; massive; moderately hard, firm, brittle; violently effervescent.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 85 to 95 percent; including 65 to 95 percent gravel, 10 to 20 percent cobbles, and 0 to 5 percent stones

*Control section:*

Depth to the upper boundary of a duripan—36 to 50 centimeters (14 to 20 inches)

Clay content—average of 8 to 12 percent

Rock fragments—average of 55 to 90 percent; including 40 to 80 percent gravel, 0 to 40 percent cobbles, and 0 to 10 percent stones

*C horizon:*

Rock fragments—85 to 95 percent; including 35 to 55 percent fine gravel, 30 to 50 percent medium and coarse gravel, 10 to 35 percent cobbles, and 0 to 5 percent stones

*A horizon:*

Hue—7.5YR or 10YR moist

Value—3 or 4 moist

Chroma—3 or 4 dry; 2 to 4 moist

Clay content—8 to 14 percent

Rock fragments—40 to 60 percent; including 30 to 50 percent gravel and 3 to 10 percent cobbles

Effervescence—strongly or violently effervescent

Calcium carbonate equivalent—0 to 5 percent

*Bk or Bkq horizon:*

Hue—7.5YR or 10YR

Value—6 or 7 dry; 4 or 5 moist

Chroma—2 to 4 dry; 3 or 4 moist

Texture of the fine-earth fraction—sandy loam or loam

Clay content—8 to 12 percent

Rock fragments—40 to 85 percent; including 35 to 60 percent gravel and 2 to 15 percent cobbles

Calcium carbonate equivalent—5 to 10 percent

Visible secondary carbonates—0 to 20 percent as coats on rock fragments

Silica—0 to 30 percent as strongly cemented durinodes in the matrix

Cementation—5 to 30 percent; very weakly or weakly cemented

*Bkqm horizon:*

Cementation—90 to 100 percent; moderately to very strongly cemented

## Missionwell Series

The Missionwell series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from basalt rock. Missionwell soils are on hills and lava flows. Slopes range from 15 to 50 percent. The mean annual precipitation is 100 millimeters (4 inches), and the mean annual air temperature is 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Torriorthents

### Typical Pedon

Missionwell gravel; Riverside County, California; on a linear, 34 percent slope under desert shrubs, in Joshua Tree National Park; 770 meters (2,525 feet) south and 689 meters (2,260 feet) east of the northwest corner of section 21, T. 3 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 596 meters (1,945 feet); lat. 33 degrees 53 minutes 44 seconds N. and long. 115 degrees 37 minutes 36 seconds W.; USGS San Bernardino Wash 7.5 minute topographic quadrangle; UTM 11S 0626979e 3751413n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

- C—0 to 4 centimeters (0 to 1.5 inches); gravel; 40 percent fine gravel, 40 percent medium and coarse gravel, and 10 percent cobbles. (3 to 11 centimeters thick)
- A—4 to 7 centimeters (1.5 to 3 inches); pale brown (10YR 6/3) extremely gravelly loamy fine sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable; slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; 40 percent fine gravel and 20 percent medium and coarse gravel; slightly effervescent; neutral (pH 6.6); clear wavy boundary. (2 to 4 centimeters thick)
- Bk—7 to 20 centimeters (3 to 8 inches); yellowish brown (10YR 5/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure parting to massive; soft, very friable; moderately sticky and moderately plastic; common fine calcium carbonate films on bottom and sides of rock fragments and few fine calcium carbonate masses throughout the matrix; few very fine and fine roots; common fine and medium tubular pores; 40 percent fine gravel and 20 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (5 to 18 centimeters thick)
- R—20 to 45 centimeters (8 to 18 inches); unweathered, slightly fractured basalt bedrock; few fine and medium roots in cracks.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 85 to 95 percent; including 55 to 80 percent gravel, 10 to 35 percent cobbles, 0 to 5 percent stones, and 0 to 5 percent boulders

#### *Control section:*

Clay content—average of 8 to 12 percent

Organic matter content—0 to 0.5 percent

Rock fragments—average of 55 to 90 percent; including 40 to 80 percent gravel, 0 to 40 percent cobbles, and 0 to 10 percent stones

Depth to a lithic contact—12 to 36 centimeters (5 to 14 inches)

#### *C horizon:*

Rock fragments—85 to 95 percent; including 30 to 45 percent fine gravel, 25 to 40 percent medium and coarse gravel, 10 to 35 percent cobbles, 0 to 5 percent stones, and 0 to 5 percent boulders

#### *A horizon:*

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4 dry; 2 or 3 moist

Texture of the fine-earth fraction—loamy fine sand, loamy very fine sand, sandy loam, or fine sandy loam  
Clay content—6 to 12 percent  
Rock fragments—50 to 80 percent; including 40 to 65 percent gravel, 0 to 25 percent cobbles, and 0 to 5 percent stones  
Effervescence—very slightly to strongly effervescent  
Calcium carbonate equivalent—0 to 5 percent  
Reaction—neutral to moderately alkaline

*Bk or Ck horizon:*

Value—5 or 6 dry  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—sandy loam, fine sandy loam, or loam  
Clay content—8 to 15 percent  
Rock fragments—40 to 85 percent; including 35 to 65 percent gravel, 0 to 40 percent cobbles, and 0 to 10 percent stones  
Effervescence—slightly to violently effervescent  
Calcium carbonate equivalent—1 to 10 percent  
Reaction—slightly alkaline to strongly alkaline

## Morongo Series

The Morongo series consists of very deep, somewhat excessively drained soils that formed in alluvium derived from granitoid and/or gneissic rocks (fig. 77). Morongo soils are on fan aprons, inset fans, and fan remnants and in drainageways. Slopes range from 2 to 30 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Mixed, thermic Typic Torripsamments

### Typical Pedon

Morongo sand; San Bernardino County, California; on a 2 percent slope under desert rangeland, 950 meters southeast of the corner of Rock Heaven Road and Singletree Road in the town of Joshua Tree; 320 meters north and 150 meters west of the southeast corner of section 8, T. 1 S., R. 7 E., San Bernardino Base and Meridian; at an elevation of 1,058 meters; lat. 34 degrees 05 minutes 42.7 seconds N. and long. 116 degrees 16 minutes 02.3 seconds W.; USGS Joshua Tree South, California 7.5 minute topographic quadrangle; UTM 11S 567588e 3772954n (DTM: NAD83). The surface is covered by 70 percent fine gravel and 5 percent medium to coarse gravel. (When described, the soil was dry throughout.)

A—0 to 2 centimeters (0 to 1 inch); light yellowish brown (10YR 6/4) sand, yellowish brown (10YR 5/4) moist; weak thick platy structure; soft, very friable; nonsticky and nonplastic; common very fine roots throughout; few very fine interstitial pores; 2 percent fine gravel; neutral (pH 7.2); abrupt smooth boundary. (2 to 23 centimeters thick)

Bw—2 to 15 centimeters (1 to 6 inches); yellowish brown (10YR 5/4) sand, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine and fine roots throughout; few very fine irregular pores; 4 percent fine gravel; slightly alkaline (pH 7.4); clear wavy boundary. (0 to 88 centimeters thick)

C1—15 to 70 centimeters (6 to 28 inches); yellowish brown (10YR 5/6) sand, dark yellowish brown (10YR 4/6) moist; massive; soft, very friable; nonsticky and





Figure 77.—An example of Morongo soils in the park. (Scale is in centimeters.)

nonplastic; few very fine roots throughout; 6 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.6); clear wavy boundary.  
C2—70 to 150 centimeters (28 to 60 inches); yellowish brown (10YR 5/6) sand, dark yellowish brown (10YR 4/6) moist; single grain; loose; nonsticky and nonplastic;

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common very fine and fine roots throughout; 5 percent fine gravel; neutral (pH 6.6). (Combined thickness of the C horizons is greater than 75 centimeters)

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days cumulative from July to September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 15 to 22 degrees C

*Surface rock fragments:* 4 to 75 percent; dominantly gravel

*Effervescence:* Noneffervescent to slightly effervescent below a depth of 100 centimeters (40 inches)

#### *Control section:*

Rock fragments—average of 3 to 30 percent; dominantly gravel

Organic matter content—0 to 0.5 percent

Clay content—1 to 8 percent

Effervescence—noneffervescent throughout

#### *A horizon:*

Value—4 to 6 dry; 2 to 5 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—sand, loamy coarse sand, loamy sand, or loamy fine sand

Clay content—1 to 8 percent

Rock fragments—2 to 20 percent; dominantly gravel

Reaction—neutral to slightly alkaline

#### *Bw or BA horizon (if it occurs):*

Value—4 to 6 dry; 3 or 4 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand

Clay content—1 to 8 percent

Rock fragments—3 to 20 percent; dominantly gravel

Reaction—slightly acid to slightly alkaline

#### *C horizon:*

Value—5 or 6 dry; 3 to 5 moist

Chroma—3 or 4 dry; 2 to 4 moist

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, or loamy sand

Clay content—1 to 8 percent

Rock fragments—1 to 32 percent; dominantly gravel

Reaction—neutral to moderately alkaline

## Nasagold Series

The Nasagold series consists of very deep, well drained soils that formed in mixed alluvium. Nasagold soils are on fan aprons, alluvial flats, and fan skirts. Slopes range from 0 to 4 percent. The mean annual precipitation is about 125 millimeters (5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Coarse-loamy, mixed, superactive, thermic Typic Haplocambids

### Typical Pedon

Nasagold gravelly fine sandy loam, 0 to 4 percent slopes; San Bernardino County, California; about 7,750 feet east and 400 feet north of the northeast corner of section 36, T. 16 N., R. 4 E. in an unsectionalized area; at an elevation of 3,155 feet (962 meters); lat. 35 degrees 26 minutes 18 seconds N. and long. 116 degrees 28 minutes 05 seconds W.; USGS Red Pass Lake NW 7.5 minute topographic quadrangle; UTM 11S 0548260e 3921570n (DTM: NAS-C). The surface is covered by 30 percent gravel. (When described on August 27, 1996, the soil was dry throughout.)

- A—0 to 8 centimeters (0 to 3 inches); pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 4/3) moist; moderate thick platy structure; soft, very friable; nonsticky and nonplastic; common very fine and few fine roots throughout; few very fine and fine interstitial pores throughout; 30 percent gravel; slightly alkaline (pH 7.4); clear smooth boundary. (3 to 15 centimeters thick)
- Bw—8 to 43 centimeters (3 to 17 inches); light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak very coarse subangular blocky structure; hard, very friable; nonsticky and nonplastic; common very fine and few fine roots throughout; few very fine and fine tubular pores throughout; 5 percent gravel; slightly alkaline (pH 7.6); clear wavy boundary. (15 to 93 centimeters thick)
- C1—43 to 95 centimeters (17 to 38 inches); light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable; nonsticky and nonplastic; common very fine and few fine roots throughout; few very fine and fine tubular pores throughout; strongly effervescent; 5 percent gravel; moderately alkaline (pH 8.0); gradual wavy boundary.
- C2—95 to 150 centimeters (38 to 60 inches); light yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable; nonsticky and nonplastic; few very fine and fine roots throughout; few very fine and fine tubular pores throughout; strongly effervescent; 10 percent gravel; moderately alkaline (pH 8.0).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 17 to 22 degrees C (63 to 72 degrees F)

*Surface rock fragments:* 5 to 60 percent gravel and 0 to 1 percent cobbles

#### *Control section:*

Clay content—5 to 15 percent

Organic matter content—0 to 0.5 percent

Effervescence—effervescent within 50 centimeters (20 inches) of the soil surface

Rock fragments—3 to 30 percent; mainly gravel

#### *A or AB horizon:*

Value—5 or 6 dry; 3 to 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy sand, sandy loam, or fine sandy loam

Clay content—4 to 10 percent

Rock fragments—5 to 35 percent gravel

Reaction—slightly alkaline or moderately alkaline

Salinity—0 to 2 dS/m

Sodium adsorption ratio—0 to 5

#### *Bw horizon:*

Hue—10YR or 7.5YR

Value—5 or 6 dry; 3 to 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—sandy loam or fine sandy loam  
Clay content—5 to 15 percent  
Rock fragments—3 to 30 percent gravel  
Effervescence—noneffervescent to slightly effervescent  
Reaction—slightly acid to moderately alkaline  
Salinity—0 to 2 dS/m  
Sodium adsorption ratio—0 to 5

*C horizon:*

Value—5 to 7 dry; 4 or 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—loamy sand, sandy loam, or fine sandy loam  
Clay content—5 to 15 percent  
Rock fragments—5 to 35 percent gravel  
Effervescence—slightly to strongly effervescent  
Reaction—slightly alkaline or moderately alkaline  
Calcium carbonate equivalent—0 to 5 percent  
Salinity—0 to 2 dS/m  
Sodium adsorption ratio—0 to 5

## Oldale Series

The Oldale series consists of very deep, well drained soils that formed in eolian material over alluvium from granitoid and/or gneissic rocks. Oldale soils are on fan remnants. Slopes range from 0 to 8 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids

### Typical Pedon

Oldale gravel; Riverside County, California; on a linear, 2 percent slope under desert pavement; about 57 meters (190 feet) west and 217 meters (710 feet) north of the southeast corner of section 30, T. 3 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 606 meters (1,989 feet); lat. 33 degrees 52 minutes 16 seconds N. and long. 115 degrees 39 minutes 07 seconds W.; USGS San Bernardino Wash 7.5 minute topographic quadrangle; UTM 11S 0624669e 3749186n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

- C—0 to 4 centimeters (0 to 1.5 inches); gravel; 65 percent gravel and 15 percent cobbles; abrupt smooth boundary. (2 to 6 centimeters thick)
- A1—4 to 7 centimeters (1.5 to 3 inches); light yellowish brown (10YR 6/4) very gravelly silt loam, dark yellowish brown (10YR 4/4) moist; moderate thin platy structure parting to weak fine subangular blocky; soft, very friable; nonsticky and nonplastic; common fine and medium vesicular pores; 20 percent fine gravel, 20 percent medium and coarse gravel, and 7 percent cobbles; violently effervescent; moderately alkaline (pH 8.0); clear smooth boundary.
- A2—7 to 16 centimeters (3 to 6.5 inches); brown (7.5YR 5/4) gravelly silt loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; soft, very friable; moderately sticky and moderately plastic; very few fine roots; common fine vesicular pores; 8 percent fine gravel, 7 percent medium and coarse gravel, and

- 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (Combined thickness of the A horizons is 3 to 13 centimeters)
- 2Bt1—16 to 38 centimeters (6.5 to 15 inches); reddish brown (5YR 4/4) extremely gravelly loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable; moderately sticky and moderately plastic; few fine tubular pores; 15 percent faint reddish brown (5YR 4/4) clay films on faces of pedis; 30 percent fine gravel, 25 percent medium and coarse gravel, and 5 percent cobbles; slightly acid (pH 6.2); clear wavy boundary.
- 2Bt2—38 to 68 centimeters (15 to 27 inches); reddish brown (5YR 4/4) extremely gravelly sandy loam, reddish brown (5YR 4/4) moist; moderate fine subangular blocky structure; hard, firm; slightly sticky and slightly plastic; few fine tubular pores; 5 percent faint reddish brown (5YR 4/4) clay films on faces of pedis; 30 percent fine gravel, 20 percent medium and coarse gravel, and 10 percent cobbles; moderately acid (pH 5.8); abrupt wavy boundary. (Combined thickness of the 2Bt horizons is 25 to 55 centimeters)
- 2C—68 to 154 centimeters (27 to 61.5 inches); brown (7.5YR 5/4) very gravelly loamy sand, brown (7.5YR 4/4) moist; single grain; loose; nonsticky and nonplastic; very few very fine interstitial pores; 15 percent fine gravel, 15 percent medium and coarse gravel, and 5 percent cobbles; moderately acid (pH 5.8).

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 80 to 95 percent; including 65 to 85 percent gravel, 10 to 25 percent cobbles, and 0 to 5 percent stones

#### *Control section:*

Clay content—average of 12 to 18 percent

Organic matter content—0 to 0.5 percent

Rock fragments—40 to 80 percent; dominantly gravel

Depth to the upper boundary of an argillic horizon from the top of the A horizon—3 to 15 centimeters

#### *C horizon:*

Rock fragments—80 to 98 percent; including 65 to 85 percent gravel, 10 to 25 percent cobbles, and 0 to 5 percent stones

#### *A horizon:*

Value—6 or 7 dry

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sandy loam, silt loam, or loam

Clay content—15 to 20 percent

Rock fragments—45 to 70 percent in the upper part of horizon, including 40 to 55 percent gravel and 0 to 15 percent cobbles; 5 to 50 percent in the lower part, including 5 to 40 percent gravel and 0 to 10 percent cobbles

Effervescence—strongly or violently effervescent

Reaction—slightly acid to moderately alkaline

Other features—some pedons are characterized by a significant quantity of vesicular pores throughout this horizon

#### *2Bt horizon:*

Hue—5YR or 7.5YR

Value—4 or 5 dry; 3 or 4 moist



Chroma—4 to 6, dry or moist

Texture of the fine-earth fraction—sandy loam or loam

Clay content—ranging from 10 to 25 percent; typically 16 to 25 percent in the upper part of horizon and 10 to 18 percent in the lower part

Rock fragments—40 to 80 percent; including 30 to 55 percent gravel and 1 to 25 percent cobbles

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly acid to slightly alkaline in the upper part of horizon and slightly acidic to neutral in the lower part

**2C horizon:**

Hue—7.5YR or 10YR

Value—4 to 6 dry

Chroma—4 to 6 dry

Texture of the fine-earth fraction—sand or loamy sand

Clay content—2 to 8 percent

Rock fragments—35 to 60 percent; including 30 to 60 percent gravel and 0 to 15 percent cobbles

Effervescence—noneffervescent or very slightly effervescent

Reaction—slightly acid to slightly alkaline

## Olympus Series

The Olympus series consists of very deep, well drained soils that formed in granitic alluvium. Olympus soils are on alluvial fans. Slopes range from 2 to 8 percent. The mean annual precipitation is about 4 inches, and the mean annual air temperature is about 67 degrees F.

### Taxonomic Classification

Loamy, mixed, superactive, thermic Arenic Haplargids

### Typical Pedon

Olympus-Cajon complex, 2 to 8 percent slopes; San Bernardino County, California; about 2,500 feet west of Fort Irwin Road; 1,500 feet west and 1,150 feet south of the northeast corner of section 3, T. 12 N., R. 2 E; at an elevation of 2,550 feet; lat. 35 degrees 10 minutes 03 seconds N. and long. 116 degrees 45 minutes 19 seconds W.; USGS Paradise Range 7.5 minute topographic quadrangle; UTM 11S 0522283e 3891488n. The surface is covered by 35 percent gravel. (Colors are for dry soil unless otherwise stated.)

A—0 to 1 inch; dark yellowish brown (10YR 4/4) gravelly loamy sand, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; slightly sticky and slightly plastic; common very fine roots throughout; strongly effervescent; 30 percent gravel; slightly alkaline (pH 7.6); abrupt smooth boundary. (1 to 7 inches thick)

C1—1 to 12 inches; yellowish brown (10YR 5/4) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable; slightly sticky and slightly plastic; few fine and medium roots throughout; strongly effervescent; 15 percent gravel; moderately alkaline (pH 8.2); clear smooth boundary.

C2—12 to 27 inches; yellowish brown (10YR 5/4) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable; slightly sticky and slightly plastic; few fine and medium roots in cracks; strongly effervescent; 30 percent gravel; moderately alkaline (pH 8.2); abrupt smooth boundary. (Combined thickness of the C horizons is 19 to 35 inches)

2Btk1—27 to 47 inches; strong brown (7.5YR 4/6) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure;

slightly hard, friable; sticky and plastic; few fine and medium roots in cracks; few thin coats on faces of peds and few thin threads of calcium carbonate throughout; strongly effervescent; 30 percent gravel; moderately alkaline (pH 8.2); clear smooth boundary.

2Btk2—47 to 55 inches; light yellowish brown (10YR 6/4) sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable; slightly sticky and slightly plastic; few fine and medium roots in cracks; few masses and threads of calcium carbonate throughout; strongly effervescent; 5 percent gravel; moderately alkaline (pH 8.2); clear smooth boundary. (Combined thickness of 2Btk horizons is 16 to 40 inches)

2Ck—55 to 83 inches; very pale brown (10YR 7/3) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable; slightly sticky and slightly plastic; strongly effervescent; 25 percent gravel; moderately alkaline (pH 8.3).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and October following convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 66 to 72 degrees F

*Organic matter content:* 0 to 0.5 percent

*Depth to upper boundary of argillic horizon:* 20 to 40 inches

*Surface rock fragments:* 30 to 65 percent gravel

#### *Control section:*

Clay content—18 to 35 percent

#### *A horizon:*

Hue—7.5YR or 10YR

Value—4 to 6 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Clay content—2 to 8 percent

Rock fragments—25 to 55 percent gravel

Calcium carbonate equivalent—1 to 5 percent

Reaction—neutral or slightly alkaline

#### *C horizon:*

Hue—7.5YR or 10YR

Value—5 dry; 4 or 5 moist

Chroma—3, 4, or 6 dry; 3 or 4 moist

Clay content—2 to 8 percent

Rock fragments—10 to 50 percent gravel

Calcium carbonate equivalent—1 to 5 percent

Reaction—slightly alkaline or moderately alkaline

#### *2Btk horizon:*

Hue—7.5YR or 10YR

Value—4 to 6, dry or moist

Chroma—4 to 6 dry; 3 or 4 moist

Texture of the fine-earth fraction—sandy loam or sandy clay loam

Rock fragments—5 to 30 percent gravel

Calcium carbonate equivalent—1 to 5 percent

Reaction—slightly alkaline or moderately alkaline

Clay content—18 to 35 percent in the upper part of horizon and 10 to 18 percent in the lower part

*2Ck horizon:*

- Value—5 to 7, dry or moist
- Chroma—3 or 4, dry or moist
- Rock fragments—20 to 30 percent gravel
- Texture of the fine-earth fraction—loamy sand or sandy loam
- Clay content—5 to 15 percent
- Calcium carbonate equivalent—1 to 5 percent

## **Pacific Mesa Series**

The Pacific Mesa series consists of shallow, well drained soils that formed in residuum and colluvium from andesite. Pacific Mesa soils are on mountains. Slopes range from 8 to 50 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### **Taxonomic Classification**

Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids

### **Typical Pedon**

Pacific Mesa complex, 4 to 50 percent slopes; Riverside County, California (in Joshua Tree National Park); about 425 meters (1,394 feet) north and 240 meters (787 feet) east of the southwest corner of section 34, T. 4 S., R. 10 E., San Bernardino Base and Meridian; at an elevation of 1,034 meters (3,391 feet); lat. 33 degrees 46 minutes 36.5 seconds N. and long. 115 degrees 55 minutes 58.6 seconds W.; USGS Washington Wash, California 7.5 minute topographic quadrangle; UTM 11S 0598800e 3737922n (DTM: NAD83). The surface is covered by approximately 30 percent fine gravel, 10 percent medium and coarse gravel, 17 percent cobbles, 12 percent stones, and 5 percent boulders. (Colors are for dry soil unless otherwise noted.)

- A1—0 to 1 centimeter (0 to 0.5 inch); brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable; slightly sticky and nonplastic; 5 percent fine gravel and 3 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.1); abrupt smooth boundary.
- A2—1 to 5 centimeters (0.5 inch to 2 inches); brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable; slightly sticky and nonplastic; few very fine and fine roots; 5 percent fine gravel and 5 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 8.1); clear smooth boundary.
- Bkq1—5 to 22 centimeters (2 to 8.5 inches); pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable; slightly sticky and slightly plastic; few very fine, fine, and medium roots; 15 percent white (10YR 8/1) calcium carbonate coats and 5 percent brown (7.5YR 5/4) silica coats on rock fragments; 5 percent fine gravel, 15 percent medium and coarse gravel, 10 percent cobbles, and 10 percent stones; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
- Bkq2—22 to 42 centimeters (8.5 to 16.5 inches); pale brown (10YR 6/3) extremely cobbly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; few fine and very few medium roots; 5 percent brown (7.5YR 5/4) silica coats on rock fragments and 15 percent coarse white (10YR 8/1) irregular weakly cemented durinodes in the matrix; 5 percent fine gravel, 20 percent medium and coarse gravel, 30 percent cobbles, and 80 percent stones; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.
- R—42 centimeters (16.5 inches); hard unweathered andesite.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Organic matter content:* 0 to 0.5 percent

*Control section:*

Rock fragments—average of 60 to 85 percent; mainly gravel in most pedons

Clay content—6 to 12 percent

Depth to the upper boundary of a cambic horizon—5 to 10 centimeters (2 to 4 inches)

Depth to lithic contact—36 to 50 centimeters (14 to 20 inches)

*A horizon:*

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sandy loam or silt loam

Clay content—6 to 8 percent

Rock fragments—5 to 35 percent; including 5 to 25 percent gravel and 0 to 10 percent cobbles

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline or moderately alkaline

*Bk and Bkq horizons:*

Hue—7.5YR or 10YR

Value—5 or 6 dry

Chroma—3 or 4, dry or moist

Clay content—6 to 12 percent

Rock fragments—35 to 75 percent; including 20 to 35 percent gravel, 10 to 30 percent cobbles, and 8 to 35 percent stones

Calcium carbonate equivalent—0 to 5 percent

Visible secondary carbonates—0 to 15 percent as coats on rock fragments

Silica—0 to 15 percent as durinodes in the matrix and 0 to 5 percent as films on rock fragments

## Patscamp Series

The Patscamp series consists of very deep, well drained soils that formed in alluvium derived from granitoid rocks. Patscamp soils are on fan aprons over fan remnants. Slopes range from 2 to 8 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Fine-loamy, mixed, superactive, hyperthermic Calcic Paleargids

### Typical Pedon

Patscamp loamy fine sand; Riverside County, California; on a linear, 4 percent slope under burrobush and creosote bush, about 7.75 kilometers (4.8 miles) southwest of the junction of Highways 62 and 177, about 1.1 kilometers (0.7 mile) south and 213 meters (700 feet) west of the junction of MWD Aqueduct Road and Old Patton Camps Supply Road; 213 meters (700 feet) south and 176 meters (577 feet) west of the northeast corner of section 23, T. 2 S., R. 16 E., San Bernardino Base and

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Meridian; at an elevation of 312 meters (1,024 feet); lat. 33 degrees 59 minutes 17.6 seconds N. and long. 115 degrees 15 minutes 52.8 seconds W.; USGS Coxcomb Mountains 7.5 minute topographic quadrangle; UTM 11S 0660286e 3762205n (DTM: NAD83). The surface is covered by approximately 25 percent fine gravel and 50 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted).

- A—0 to 3 centimeters (0 to 1 inch); very pale brown (10YR 7/4) loamy fine sand, brown (10YR 4/3) moist; moderate thick platy structure; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; few fine and few medium vesicular pores; 5 percent fine gravel and 5 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.1); clear wavy boundary. (2 to 5 centimeters thick)
- C—3 to 26 centimeters (1 to 10 inches); very pale brown (10YR 7/3) gravelly sand, brown (10YR 5/3) moist; single grain; loose; nonsticky and nonplastic; common very fine and fine and few medium roots; 10 percent fine gravel and 5 percent medium and coarse gravel; very slightly effervescent; strongly alkaline (pH 8.5); abrupt smooth boundary. (20 to 45 centimeters thick)
- 2Btk—26 to 43 centimeters (10 to 17 inches); strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; hard, very friable; slightly sticky and moderately plastic; very few fine roots; 30 percent distinct strong brown (7.5YR 4/6) clay films on faces of peds; 5 percent prominent very pale brown (10YR 8/2) fine calcium carbonate threads on all ped faces; 4 percent fine gravel and 1 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
- 2Btkq1—43 to 89 centimeters (17 to 35 inches); brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; hard, friable; moderately sticky and moderately plastic; very few fine roots; 10 percent distinct brown (7.5YR 4/4) clay films on faces of peds; 5 percent prominent very pale brown (10YR 8/2) medium irregular calcium carbonate masses in the matrix; 15 percent prominent very pale brown (10YR 7/3) medium irregular strongly cemented durinodes in the matrix; 5 percent fine gravel and 2 percent medium and coarse gravel; strongly effervescent (7 percent calcium carbonate equivalent in the fine-earth fraction); strongly alkaline (pH 8.7); gradual wavy boundary.
- 2Btkq2—89 to 114 centimeters (35 to 45 inches); brown (7.5YR 5/4) sandy loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure parting to massive; moderately hard, friable; slightly sticky and moderately plastic; 5 percent distinct brown (7.5YR 4/4) clay films on faces of peds; 10 percent prominent light gray (10YR 7/2) fine irregular soft calcium carbonate masses in the matrix; 5 percent prominent very pale brown (10YR 7/3) fine and medium irregular moderately cemented durinodes in the matrix; 5 percent fine gravel and 2 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.4); gradual wavy boundary. (Combined thickness of the 2Btk and 2Btkq horizons is 15 to 90 centimeters)
- 2Bkq1—114 to 135 centimeters (45 to 53 inches); very pale brown (10YR 8/3) sandy loam, light brown (7.5YR 6/3) moist; massive; slightly hard, friable; slightly sticky and slightly plastic; 5 percent prominent very pale brown (10YR 8/2) medium irregular calcium carbonate masses in the matrix; 25 percent distinct very pale brown (10YR 8/2) fine and medium irregular moderately cemented durinodes in the matrix; 5 percent fine gravel and 5 percent medium and coarse gravel; violently effervescent (15 percent calcium carbonate equivalent in the fine-earth fraction); strongly alkaline (pH 8.7); gradual wavy boundary.
- 2Bkq2—135 to 160 centimeters (53 to 65 inches); very pale brown (10YR 8/3) gravelly sandy loam, light brown (7.5YR 6/3) moist; massive; moderately hard, friable; slightly sticky and nonplastic; 2 percent prominent very pale brown (10YR 8/2) fine irregular calcium carbonate masses in the matrix; 2 percent prominent very



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pale brown (10YR 7/4) silica coats on rock fragments; 15 percent distinct very pale brown (10YR 8/2) fine and medium irregular moderately cemented durinodes in the matrix; 10 percent fine gravel and 5 percent medium and coarse gravel; violently effervescent (9 percent calcium carbonate equivalent in the fine-earth fraction); strongly alkaline (pH 8.8). (Combined thickness of the 2Bkq horizons is 35 to 90 centimeters)

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 50 to 80 percent

#### *Control section:*

Clay content—18 to 27 percent

Organic matter content—0 to 0.5 percent

Rock fragments—5 to 15 percent gravel

Depth to the upper boundary of an argillic horizon—25 to 50 centimeters (10 to 20 inches)

Depth to the upper boundary of a calcic horizon—75 to 125 centimeters (30 to 50 inches)

#### *A horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy sand or loamy fine sand

Clay content—2 to 6 percent

Rock fragments—5 to 10 percent

Effervescence—noneffervescent to slightly effervescent

Calcium carbonate equivalent—0 to 1 percent

Reaction—slightly alkaline or moderately alkaline

#### *C horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—coarse sand, sand, or loamy sand

Clay content—1 to 6 percent

Rock fragments—5 to 15 percent

Effervescence—noneffervescent to slightly effervescent

Calcium carbonate equivalent—0 to 1 percent

Reaction—slightly alkaline to strongly alkaline

#### *2Bt, 2Btk, or 2Btkq horizon:*

Hue—7.5YR or 10YR

Value—4 to 6 dry; 4 or 5 moist

Chroma—4 to 6, dry or moist

Texture of the fine-earth fraction—sandy loam or sandy clay loam

Clay content—18 to 27 percent

Rock fragments—3 to 15 percent

Effervescence—noneffervescent to strongly effervescent

Calcium carbonate equivalent—1 to 20 percent

Reaction—slightly alkaline to strongly alkaline  
Visible secondary carbonates—0 to 20 percent as masses in the matrix  
Silica—0 to 20 percent as durinodes

*2Bk or 2Bkq horizon:*

Hue—7.5YR or 10YR  
Value—7 or 8 dry; 5 or 6 moist  
Chroma—2 to 4 dry; 3 or 4 moist  
Clay content—8 to 15 percent  
Rock fragments—5 to 20 percent  
Calcium carbonate equivalent—5 to 25 percent  
Reaction—moderately alkaline or strongly alkaline  
Visible secondary carbonates—0 to 20 percent as masses in the matrix  
Silica—0 to 35 percent as durinodes

*2Ck or 2Ckq horizon (if it occurs):*

Hue—7.5YR or 10YR  
Value—7 or 8 dry; 5 or 6 moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—sand or loamy sand  
Clay content—1 to 6 percent  
Rock fragments—5 to 20 percent  
Effervescence—strongly or violently effervescent  
Calcium carbonate equivalent—5 to 10 percent  
Reaction—moderately alkaline or strongly alkaline  
Visible secondary carbonates—0 to 20 percent disseminated or as coats on rock fragments  
Silica—0 to 10 percent as films on rock fragments

In map unit 2060, the Patscamp soils are considered a taxadjunct to the series. These soils have less carbonates within the control section than the Patscamp series. This difference, however, does not affect the use and management of the soils.

## Perurose Series

The Perurose series consists of moderately deep, somewhat excessively drained soils that formed in alluvium from granitoid and/or gneissic rocks. Perurose soils are on fan remnants. Slopes range from 2 to 15 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Sandy, mixed, hyperthermic Cambidic Haplodurids

### Typical Pedon

Perurose gravel; Riverside County, California; on a south-facing, convex, 3 percent slope under sparse desert shrubs, approximately 11 kilometers (6.8 miles) northwest of the junction of Highway 177 and MWD Aqueduct Road, 1 kilometer (0.6 mile) north of the junction of MWD Powerline Road and MWD Aqueduct Road; 735 meters (2,410 feet) north and 690 meters (2,260 feet) west of the southeast corner of section 25, T. 3 S., R. 15 E., San Bernardino Base and Meridian; at an elevation of 320 meters (1,050 feet); lat. 33 degrees 52 minutes 51.3 seconds N. and long. 115 degrees 21 minutes 40.7 seconds W.; USGS Coxcomb Mountains 7.5 minute topographic quadrangle;

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UTM 11S 0651550e 3750162n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

- C—0 to 5 centimeters (0 to 2 inches); gravel; approximately 35 percent fine gravel, 30 percent medium and coarse gravel, and 15 percent cobbles; abrupt smooth boundary. (0 to 7 centimeters thick)
- A—5 to 7 centimeters (2 to 3 inches); very pale brown (10YR 7/4) loamy fine sand, brown (10YR 5/3) moist; weak thin platy structure; soft, very friable; nonsticky and nonplastic; few very fine roots; few very fine, fine, and medium vesicular pores; 7 percent fine gravel and 3 percent medium and coarse gravel; violently effervescent; strongly alkaline (pH 8.7); clear wavy boundary. (1 to 7 centimeters thick)
- Bk—7 to 18 centimeters (3 to 7 inches); very pale brown (10YR 7/4) loamy fine sand, light yellowish brown (10YR 6/4) moist; weak fine subangular blocky structure parting to massive; slightly hard, very friable; nonsticky and nonplastic; few very fine and fine roots; 4 percent fine gravel and 1 percent medium and coarse gravel; violently effervescent; strongly alkaline (pH 8.9); clear wavy boundary.
- Bkq—18 to 45 centimeters (7 to 18 inches); very pale brown (10YR 7/4) loamy sand, light yellowish brown (10YR 6/4) moist; weak medium subangular blocky structure parting to massive; slightly hard, very friable; nonsticky and nonplastic; very few fine, medium, and coarse roots; 7 percent fine and 5 percent medium irregular weakly cemented durinodes within the matrix; 5 percent fine gravel; violently effervescent; strongly alkaline (pH 8.6); gradual wavy boundary.
- C'—45 to 76 centimeters (18 to 30 inches); brownish yellow (10YR 6/6) sand, dark yellowish brown (10YR 4/4) moist; single grain; soft, very friable; nonsticky and nonplastic; very few fine roots; 6 percent fine gravel and 1 percent medium and coarse gravel; very slightly effervescent; moderately alkaline (pH 8.3); abrupt smooth wavy boundary. (Combined thickness of the B and C horizons is 50 to 88 centimeters)
- 2Bkqm—76 to 110 centimeters (30 to 43 inches); very pale brown (10YR 7/4) moderately cemented sand, light yellowish brown (10YR 6/4) moist; continuous duripan with 100 percent cementation; massive; very hard, extremely firm; nonsticky and nonplastic; violently effervescent; clear wavy boundary. (9 to 75 centimeters thick)
- 2C—110 to 152 centimeters (43 to 60 inches); very pale brown (10YR 7/3) gravelly sand, pale brown (10YR 6/3) moist; single grain; loose; nonsticky and nonplastic; 20 percent fine gravel and 5 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.4).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 40 to 95 percent; including 25 to 50 percent fine gravel, 15 to 55 percent medium and coarse gravel, 0 to 20 percent cobbles, and 0 to 5 percent stones

*Control section:*

Rock fragments—average of 5 to 30 percent; mainly gravel with some cobbles and stones

Clay content—1 to 10 percent

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Organic matter content—0 to 0.25 percent

Depth to the upper boundary of a duripan—50 to 100 centimeters (20 to 40 inches)

*C horizon (if it occurs):*

Rock fragments—80 to 95 percent; including 20 to 50 percent fine gravel, 20 to 55 percent medium and coarse gravel, and 0 to 20 percent cobbles

*A horizon:*

Hue—10YR or 2.5Y

Value—5 to 7 dry; 3 to 6 moist

Chroma—3 or 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—sand, fine sand, loamy sand, loamy fine sand, or fine sandy loam

Clay content—1 to 12 percent

Rock fragments—1 to 14 percent gravel

Effervescence—noneffervescent to violently effervescent

Calcium carbonate equivalent—0 to 10 percent

Reaction—slightly alkaline to strongly alkaline

*Bk and Bkq horizons:*

Hue—7.5YR, 10YR, or 2.5Y

Value—5 to 8 dry; 4 to 7 moist

Chroma—2 to 6, dry or moist

Texture of the fine-earth fraction—sand, fine sand, loamy coarse sand, loamy sand, loamy fine sand, or fine sandy loam

Clay content—1 to 12 percent

Rock fragments—1 to 35 percent; including 1 to 30 percent gravel and 0 to 10 percent cobbles

Effervescence—noneffervescent to violently effervescent

Calcium carbonate equivalent—0 to 15 percent

Reaction—slightly alkaline to very strongly alkaline

Silica—0 to 20 percent as coats on bottom of rock fragments and 0 to 40 percent as weakly or moderately cemented durinodes

*2Bkqm or 2Bkq horizon:*

Hue—10YR or 2.5Y

Value—6 to 8 dry; 4 to 7 moist

Chroma—2 to 4 dry; 3 or 4 moist

Texture of the fine-earth fraction—sand, loamy coarse sand, or loamy sand

Clay content—1 to 6 percent

Rock fragments—3 to 15 percent; including 0 to 10 percent gravel

Calcium carbonate equivalent—1 to 10 percent

Reaction—neutral to moderately alkaline

Cementation—weak to strong with 75 to 100 percent continuity

*2C or 2Ck horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry; 5 or 6 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—coarse sand, sand, or loamy sand

Clay content—1 to 6 percent

Rock fragments—5 to 30 percent gravel

Effervescence—slightly to violently effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline to strongly alkaline

## Pinecity Series

The Pinecity series consists of very shallow and shallow, somewhat excessively drained soils that formed in colluvium and/or alluvium over residuum derived from granite, granitoid, or gneissic rocks. Pinecity soils are on hills, mountains, and fan aprons over pediments. Slopes range from 2 to 75 percent. The mean annual precipitation is about 125 millimeters (5 inches), and the mean annual air temperature is about 15.5 degrees C (60 degrees F).

### Taxonomic Classification

Mixed, thermic, shallow Typic Torripsamments

### Typical Pedon

Pinecity gravelly loamy sand; San Bernardino County, California; on a 29 percent slope under desert shrubs, approximately 0.75 kilometer east of Park Boulevard near the west entrance to Joshua Tree National Park; approximately 389 meters east and 802 meters south of the northwest corner of section 23, T. 1 S., R. 7 E.; at an elevation of 1,244 meters (4,080 feet); lat. 34 degrees 04 minutes 14.0 seconds N. and long. 116 degrees 13 minutes 40.3 seconds W.; USGS Indian Cove, California 7.5 minute topographic quadrangle; UTM 11S 0571249 3770243n (DTM: NAD83). The surface is covered by 25 percent fine gravel, 30 percent medium and coarse gravel, 20 percent cobbles, 2 percent stones, and 1 percent boulders. (When described, the soil was dry throughout.)

- A—0 to 3 centimeters (0 to 1 inch); brown (10YR 4/3) gravelly loamy sand, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; common fine roots throughout; very few very fine tubular pores; 10 percent fine gravel, 10 percent medium to coarse gravel, and 5 percent cobbles; neutral (pH 7.2); clear wavy boundary. (2 to 12 centimeters thick)
- Bw—3 to 15 centimeters (1 to 6 inches); brown (10YR 4/3) gravelly loamy sand, dark brown (10YR 3/3) moist; weak medium and coarse subangular blocky structure; moderately hard, very friable; nonsticky and nonplastic; common fine roots throughout; very few very fine irregular pores; 2 percent fine paragravel, 10 percent fine gravel, 3 percent medium to coarse gravel, and 3 percent cobbles; neutral (pH 7.2); abrupt wavy boundary. (4 to 14 centimeters thick)
- Cr—15 to 150 centimeters (6 to 60 inches); weathered, fractured, extremely weakly cemented granitoid bedrock; low excavation difficulty; fractures are more than 20 centimeters apart; very few very fine roots in cracks and very few fine roots matted at the top of horizon.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 15 to 19 degrees C

*Surface rock fragments:* 25 to 80 percent; dominantly medium and coarse gravel

*Control section:*

Clay content—1 to 9 percent

Rock fragments—5 to 34 percent; dominantly gravel

Organic matter content—0 to 0.50 percent

Effervescence—noneffervescent throughout

Depth to a paralithic contact—5 to 36 centimeters (2 to 14 inches)



*A horizon:*

Value—4 to 6 dry; 3 or 4 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—2 to 9 percent

Rock fragments—2 to 35 gravel (dominantly very strongly cemented to indurated gravel), 0 to 5 percent cobbles, and 0 to 13 percent paragravel

Reaction—neutral to moderately alkaline

*Bw or C horizon:*

Value—4 to 6 dry; 3 or 4 moist

Chroma—3 to 6, dry or moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—1 to 9 percent

Rock fragments—2 to 34 percent; dominantly gravel and 0 to 5 percent parafragments

Reaction—neutral to moderately alkaline

## **Pinkcan Series**

The Pinkcan series consists of very deep, well drained soils that formed in alluvium from various igneous rocks and/or gneiss. Pinkcan soils are on fan remnants. Slopes range from 2 to 15 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 16.5 degrees C (61.5 degrees F).

### **Taxonomic Classification**

Fine-loamy, mixed, superactive, thermic Duric Petroargids

### **Typical Pedon**

Pinkcan loam; Riverside County, California; on a north-facing, convex, 2 percent slope under sparse desert shrubs, approximately 2.5 kilometers north-northwest of the junction of Pintobasin Road and Pinkham Canyon Road, in Joshua Tree National Park; 235 meters (772 feet) south and 270 meters (885 feet) east of the northwest corner of section 3, T. 5 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 948 meters (3,110 feet); lat. 33 degrees 46 minutes 15.0 seconds N. and long. 115 degrees 49 minutes 53.9 seconds W.; USGS Porcupine Wash 7.5 minute topographic quadrangle; UTM 11S 0608188e 3737360n (DTM: NAD83). The surface is covered by approximately 20 percent fine gravel, 50 percent medium and coarse gravel, and 5 percent cobbles. (When described, the soil was dry throughout.)

A—0 to 3 centimeters (0 to 1 inch); pink (7.5YR 7/4) loam, brown (7.5YR 5/4) moist; moderate thick platy structure; slightly hard, friable; slightly sticky and moderately plastic; very few fine roots; common very fine and fine, few medium, and very few coarse vesicular pores; 8 percent fine gravel, 2 percent medium and coarse gravel, and 1 percent cobbles; very slightly effervescent; neutral (pH 7.3); abrupt smooth boundary. (1 to 6 centimeters thick)

Bt1—3 to 27 centimeters (1 to 11 inches); yellowish red (5YR 5/6) sandy loam, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; hard, firm; moderately sticky and moderately plastic; very few medium roots; 10 percent faint reddish brown (5YR 4/4) clay films on faces of peds; 8 percent fine gravel and 2 percent medium and coarse gravel; very slightly effervescent; slightly alkaline (pH 7.4); clear wavy boundary.

Bt2—27 to 49 centimeters (11 to 19 inches); strong brown (7.5YR 5/6) sandy clay loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure;

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moderately hard, firm; moderately sticky and moderately plastic; very few medium roots; 5 percent distinct dark yellowish brown (10YR 3/4) clay films on faces of peds; 8 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.6); gradual wavy boundary.

- Btk—49 to 63 centimeters (19 to 25 inches); brown (7.5YR 5/4) loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure; slightly hard, friable; moderately sticky and moderately plastic; 3 percent faint dark yellowish brown (10YR 3/4) clay films on faces of peds; 1 percent faint light gray (10YR 7/2) calcium carbonate coats on bottom of rock fragments; 4 percent fine gravel and 1 percent medium and coarse gravel; moderately alkaline (pH 8.0); gradual wavy boundary. (Combined thickness of the Bt horizons is 40 to 105 centimeters)
- BC—63 to 72 centimeters (25 to 28 inches); yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, very friable; slightly sticky and slightly plastic; 9 percent fine gravel, 1 percent medium and coarse gravel, and 2 percent cobbles; slightly alkaline (pH 7.6); gradual wavy boundary. (0 to 10 centimeters thick)
- C—72 to 83 centimeters (28 to 33 inches); brown (10YR 5/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable; nonsticky and nonplastic; 18 percent fine gravel, 7 percent medium and coarse gravel, and 3 percent cobbles; slightly alkaline (pH 7.6); clear wavy boundary. (0 to 15 centimeters thick)
- 2Bt—83 to 120 centimeters (33 to 47 inches); yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; moderately hard, friable; slightly sticky and slightly plastic; 5 percent distinct dark yellowish brown (10YR 3/4) clay films on faces of peds; 10 percent fine gravel and 5 percent medium and coarse gravel; slightly alkaline (pH 7.6); abrupt wavy boundary. (0 to 30 centimeters thick)
- 2Bkqm—120 to 150 centimeters (47 to 59 inches); light yellowish brown (10YR 6/4) weakly cemented loamy sand, yellowish brown (10YR 5/4) moist; duripan with 90 percent cementation; massive; very hard, brittle; slightly sticky and nonplastic; strongly effervescent.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 15 to 22 degrees C (59 to 72 degrees F)

*Surface rock fragments:* 75 to 80 percent; including 25 to 64 percent fine gravel, 20 to 50 percent medium and coarse gravel, 0 to 15 percent cobbles, 0 to 5 percent stones, and 0 to 2 percent boulders

#### *Control section:*

Rock fragments—average of 10 to 35 percent; including 3 to 40 percent gravel, 0 to 15 percent cobbles, and 0 to 5 percent stones

Clay content—ranging from 15 to 30 percent; average of 20 to 30 percent

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of an argillic horizon—1 to 6 centimeters (0.5 inch to 2.5 inches)

Depth to the upper boundary of a duripan—100 to 150 centimeters (40 to 59 inches)

#### *A horizon:*

Hue—7.5YR or 10YR

Value—5 to 7 dry; 3 to 5 moist

Chroma—4 to 6 dry; 3 to 6 moist

Texture of the fine-earth fraction—sandy loam or loam  
Clay content—10 to 20 percent  
Rock fragments—1 to 15 percent; including 1 to 15 percent gravel and 0 to 5 percent cobbles  
Effervescence—noneffervescent to violently effervescent  
Reaction—neutral or slightly alkaline

*Bt, Btk, or Btkq horizon:*

Hue—5YR, 7.5YR, or 10YR  
Value—4 or 5 dry; 3 to 5 moist  
Chroma—4 to 6, dry or moist  
Texture of the fine-earth fraction—sandy loam, loam, sandy clay loam, or clay loam  
Clay content—15 to 30 percent  
Rock fragments—3 to 50 percent; including 3 to 40 percent gravel and 0 to 15 percent cobbles  
Effervescence—noneffervescent to strongly effervescent  
Reaction—neutral to moderately alkaline  
Calcium carbonate equivalent—0 to 1 percent  
Silica—0 to 5 percent as films on rock fragments

*BC, C, and 2Bt horizons (if they occur):*

Value—3 or 4 moist  
Chroma—3 or 4, dry or moist  
Clay content—8 to 15 percent  
Rock fragments—10 to 30 percent; including 10 to 30 gravel and 0 to 5 percent cobbles

*2Bkq horizon (if it occurs):*

Value—4 to 7 dry; 4 to 6 moist  
Chroma—3 to 6 dry; 4 to 6 moist  
Texture of the fine-earth fraction—loamy sand or sandy loam  
Clay content—4 to 18 percent  
Rock fragments—10 to 45 percent; including 10 to 35 percent gravel and 0 to 10 percent cobbles  
Effervescence—strongly or violently effervescent  
Calcium carbonate equivalent—0 to 1 percent  
Silica—0 to 15 percent as weakly to moderately cemented durinodes and 0 to 8 percent as coats on bottom of rock fragments

*2Bkqm horizon:*

Texture of the fine-earth fraction—loamy sandy or sandy loam  
Clay content—4 to 12 percent  
Rock fragments—10 to 45 percent; including 10 to 45 percent gravel and 0 to 10 percent cobbles  
Cementation—weak to moderate; 50 to 90 percent continuous cementation

## **Pintobasin Series**

The Pintobasin series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium from dominantly granitoid rock. Pintobasin soils are on fan remnants, alluvial fans, fan aprons, and inset fans and in drainageways. Slopes range from 0 to 15 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### **Taxonomic Classification**

Mixed, hyperthermic Typic Torripsamments

### Typical Pedon

Pintobasin gravelly sand; Riverside County, California; on a linear, 1 percent slope under desert shrubs and grasses; about 121 meters (400 feet) east and 700 meters (2,300 feet) south of the northwest corner of section 27, T. 3 S., R. 12 E., San Bernardino Base and Meridian; at an elevation of 584 meters (1,915 feet); lat. 33 degrees 52 minutes 35 seconds N. and long. 115 degrees 43 minutes 13 seconds W.; USGS San Bernardino Wash 7.5 minute topographic quadrangle; UTM 11S 618355e 3749201n (DTM: NAD83). The surface is covered by approximately 25 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

- A—0 to 4 centimeters (0 to 1.5 inches); pale brown (10YR 6/3) gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak thin platy structure; loose; nonsticky and nonplastic; many very fine and few fine roots; few fine tubular pores; 15 percent gravel; slightly acid (pH 6.4); clear wavy boundary. (2 to 8 centimeters thick)
- AC—4 to 11 centimeters (1.5 to 4 inches); light yellowish brown (10YR 6/4) gravelly sand, brown (10YR 4/3) moist; weak thin platy structure parting to massive; loose; nonsticky and nonplastic; many very fine and fine and few medium roots; few fine tubular pores; 17 percent gravel; slightly acid (pH 6.4); clear wavy boundary. (0 to 40 centimeters thick)
- C1—11 to 61 centimeters (4 to 24 inches); light yellowish brown (10YR 6/4) stratified gravelly sand and sand, brown (10YR 4/3) moist; massive; loose; nonsticky and nonplastic; many very fine and fine and common medium roots; 20 percent gravel; slightly alkaline (pH 7.8); gradual wavy boundary.
- C2—61 to 150 centimeters (24 to 60 inches); light brown (7.5YR 6/3) stratified gravelly sand to sand, brown (10YR 4/3) moist; massive; loose; nonsticky and nonplastic; few very fine and fine roots; 20 percent gravel; neutral (pH 6.8). (Combined thickness of the C horizons is more than 50 centimeters)

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 10 to 75 percent; dominantly gravel

#### *Control section:*

Clay content—1 to 6 percent

Rock fragments—15 to 30 percent; dominantly gravel

#### *A horizon:*

Value—6 or 7 dry; 4 or 5 moist

Chroma—2 to 4 dry; 2 or 3 moist

Texture of the fine-earth fraction—sand, fine sand, loamy sand, loamy fine sand, or fine sandy loam

Clay content—2 to 10 percent

Rock fragments—5 to 30 percent; dominantly gravel

Effervescence—noneffervescent or very slightly effervescent

Reaction—moderately acid to slightly alkaline

#### *AC and Bw horizons (if they occur):*

Value—4 or 5 moist

Chroma—3 or 4 dry; 4 or 5 moist

Texture of the fine-earth fraction—sand, fine sand, loamy sand, or loamy fine sand  
Clay content—2 to 6 percent  
Rock fragments—5 to 30 percent; dominantly gravel  
Effervescence—noneffervescent or very slightly effervescent  
Reaction—slightly acid to moderately alkaline

*C horizon:*

Value—5 to 7 dry; 4 or 5 moist  
Chroma—2 to 4, dry or moist  
Texture of the fine-earth fraction—coarse sand, sand, loamy sand, or loamy fine sand  
Clay content—1 to 6 percent  
Rock fragments—ranging from 1 to 30 percent; average of more than 15 percent; dominantly gravel  
Effervescence—noneffervescent or very slightly effervescent  
Reaction—slightly acid to neutral in the upper part of horizon and neutral to moderately alkaline below a depth of 100 centimeters

## Pioneertown Series

The Pioneertown series consists of very shallow and shallow, excessively drained soils that formed in colluvium over residuum from granite. Pioneertown soils are on backslopes of hills. Slopes range from 15 to 60 percent. The mean annual precipitation is 175 millimeters (7 inches), and the mean annual air temperature is 15 degrees C (59 degrees F).

### Taxonomic Classification

Mixed, thermic Lithic Torripsamments

### Typical Pedon

Pioneertown gravelly coarse sand; San Bernardino County, California; on a 30 percent slope, 620 meters south of Skyline Ranch Road in the Sawtooth Mountains; 100 meters south and 200 meters west of the northeast corner of section 29, T. 1 N., R. 5 E., San Bernardino Base and Meridian; at an elevation of 1,251 meters; lat. 34 degrees 08 minutes 55 seconds N. and long. 116 degrees 28 minutes 40 seconds W.; USGS Yucca Valley North, California 7.5 minute topographic quadrangle; UTM 11S 548155e 3378759n (DTM: NAD83). The surface is covered by 65 percent fine gravel, 10 percent medium and coarse gravel, 3 percent cobbles, 1 percent stones, and 1 percent boulders. (When described, the soil was dry throughout.)

A—0 to 4 centimeters (0 to 2 inches); brown (10YR 5/3) gravelly coarse sand, dark brown (10YR 3/3) moist; weak fine subangular blocky structure parting to single grain; soft, very friable; nonsticky and nonplastic; common very fine roots throughout; common very fine interstitial pores; 18 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.4); clear smooth boundary. (3 to 10 centimeters thick)

Bw—4 to 15 centimeters (2 to 6 inches); brown (10YR 5/3) gravelly sand, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine roots throughout; common fine and very fine tubular pores; 27 percent fine gravel and 3 percent medium and coarse gravel; neutral (pH 7.2); abrupt wavy boundary. (0 to 20 centimeters thick)

Rt—15 to 40 centimeters (6 to 12 inches); indurated granitic bedrock; common very fine roots in cracks; 2 percent distinct brown (10YR 4/3) clay films on top surface of horizon.



### Range in Characteristics

*Soil moisture control section:* Usually dry from May 1 to November 30 and moist in some or all parts the rest of the year; the soils have an aridic soil moisture regime bordering on xeric

*Soil temperature:* 15 to 19 degrees C

*Surface rock fragments:* 80 to 95 percent; dominantly fine gravel

*Control section:*

Rock fragments—15 to 34 percent; dominantly fine gravel

Clay content—3 to 8 percent

Organic matter content—0.25 to 1 percent

Depth to lithic contact—4 to 36 centimeters (2 to 14 inches)

Effervescence—noneffervescent throughout the control section

*A horizon:*

Hue—10YR or 2.5Y

Value—3 or 4 moist

Chroma—3 or 4 dry; 2 to 4 moist

Texture of the fine-earth fraction—coarse sand, sand, or loamy sand

Clay content—2 to 6 percent

Rock fragments—15 to 34 percent

Reaction—neutral to slightly alkaline

*Bw horizon (if it occurs):*

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—3 to 5 percent

Rock fragments—10 to 30 percent

*C horizon (if it occurs):*

Value—5 or 6 dry

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—coarse sand or loamy sand

Clay content—2 to 8 percent

Rock fragments—10 to 34 percent; including 10 to 34 gravel and 0 to 5 percent cobbles

Note—some pedons have either a thin layer of gravel above the R horizon or a thin veneer of Cr material above the hard bedrock

## Popups Series

The Popups series consists of well drained soils that are moderately deep to a duripan and that formed in mixed alluvium. Popups soils are on fan remnants. Slopes range from 2 to 30 percent. The mean annual precipitation is about 5 inches, and the mean annual air temperature is about 66 degrees F.

### Taxonomic Classification

Coarse-loamy, mixed, superactive, thermic Argidic Argidurids

### Typical Pedon

Popups-Cronese association, 2 to 8 percent slopes; San Bernardino County, California; approximately 1 mile east-southeast of No Name Lake in the Fort Irwin National Training Center; about 750 feet north and 2,300 feet west of the southwest corner of section 31, T. 16 N., R. 6 E.; at an elevation of 3,200 feet; lat. 35 degrees 25

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minutes 56 seconds N. and long. 116 degrees 27 minutes 36 seconds W.; USGS Red Pass Lake NW, California 7.5 minute topographic quadrangle; UTM 11S 0549000e 3920970n. The surface is partially covered by approximately 45 percent gravel. (Colors are for dry soil unless otherwise noted.)

- A—0 to 2 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; weak medium platy structure; slightly hard, very friable; nonsticky and nonplastic; common very fine and few fine roots; common fine interstitial and few very fine and fine tubular pores; 45 percent gravel; noneffervescent; slightly alkaline (pH 7.6); abrupt smooth boundary. (2 to 4 inches thick)
- Bw—2 to 12 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; common very fine and few fine and medium roots; few very fine and fine tubular pores; 30 percent gravel; noneffervescent; slightly alkaline (pH 7.6); gradual wavy boundary. (0 to 10 inches thick)
- Btk—12 to 33 inches; light brown (7.5YR 6/4) gravelly sandy loam, brown (7.5YR 4/4) moist; moderate coarse subangular blocky structure; very hard, very friable; slightly sticky and slightly plastic; common very fine and few fine and medium roots; common very fine and few fine interstitial and tubular pores; many discontinuous faint clay skins on faces of peds and sand and gravel coats; few fine irregular soft seams of lime; 15 percent gravel, 3 percent cobbles, and 5 percent stones; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (10 to 20 inches thick)
- Bkqm—33 to 60 inches; very pale brown (10YR 8/2) weakly cemented duripan, pale brown (10YR 6/3) moist; massive; very hard, very firm, brittle; violently effervescent.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and October following convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 63 to 72 degrees F

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 40 to 75 percent gravel, 0 to 20 percent cobbles, and 0 to 10 percent stones

#### *Control section:*

Clay content—10 to 18 percent

Depth to duripan—20 to 40 inches

Rock fragments—average of 15 to 35 percent; mainly gravel

#### *A horizon:*

Value—4 to 7 dry; 3 to 6 moist

Chroma—3 or 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—sandy loam, fine sandy loam, or loam

Clay content—8 to 12 percent

Rock fragments—10 to 80 percent; including 10 to 70 percent gravel, 0 to 5 cobbles, and 0 to 5 stones

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

#### *Bw horizon (if it occurs):*

Value—5 to 7 dry; 4 or 5 moist

Chroma—3 or 4 dry; 4 to 6 moist

Clay content—8 to 15 percent

Rock fragments—15 to 35 percent gravel  
Reaction—slightly alkaline or moderately alkaline

*Bt or Btk horizon:*

Hue—7.5YR or 10YR  
Value—4 to 7 dry; 4 to 6 moist  
Chroma—4 to 6 dry; 3 to 6 moist  
Texture of the fine-earth fraction—coarse sandy loam, sandy loam, or sandy clay loam  
Clay content—average of 10 to 18 percent; ranging from 8 to 25 percent  
Rock fragments—15 to 40 percent; including 15 to 35 percent gravel, 0 to 3 cobbles, and 0 to 5 stones  
Effervescence—noneffervescent to violently effervescent  
Reaction—slightly alkaline or moderately alkaline  
Calcium carbonate equivalent—1 to 5 percent

*Bkqm horizon:*

Hue—10YR or 2.5Y  
Value—7 or 8 dry; 6 or 8 moist  
Chroma—2 or 3 dry; 3 or 4 moist  
Cementation—weak or moderate

## Rainbowsend Series

The Rainbowsend series consists of shallow, somewhat excessively drained soils that formed in alluvium from granitoid and/or gneissic rocks. Rainbowsend soils are on side slopes of fan remnants. Slopes range from 8 to 50 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids

### Typical Pedon

Rainbowsend stones; Riverside County, California; on a north-facing, convex, 37 percent slope under desert shrubs, about 8.5 kilometers (5.2 miles) north-northwest along Pinto Basin Road from the junction of Pinto Basin and Old Dale Roads, in Joshua Tree National Park; 196 meters (643 feet) west and 10 meters (33 feet) north of the southeast corner of section 21, T. 3 S., R. 11 E., San Bernardino Base and Meridian; at an elevation of 611 meters (2,004 feet); lat. 33 degrees 53 minutes 10.1 seconds N. and long. 115 degrees 49 minutes 36.2 seconds W.; USGS Pinto Mountain 7.5 minute topographic quadrangle; UTM 11S 0608496e 3750151n (DTM: NAD83). (Colors are for dry soil unless otherwise noted).

- C—0 to 14 centimeters (0 to 5.5 inches); stones; 10 percent fine gravel, 10 percent medium gravel, 30 percent cobbles, 25 percent stones, and 10 percent boulders. (4 to 15 centimeters thick)
- A—14 to 17 centimeters (5.5 to 6.5 inches); brown (10YR 5/3) very gravelly loamy sand, dark olive brown (2.5Y 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; very few fine vesicular and few fine tubular pores; 20 percent fine gravel, 10 percent medium and coarse gravel, and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (2 or 3 centimeters thick)
- Bkq1—17 to 39 centimeters (6.5 to 15 centimeters); pale brown (10YR 6/3) very gravelly fine sandy loam, olive brown (2.5Y 4/3) moist; weak fine subangular

blocky structure; slightly hard, very friable; slightly sticky and slightly plastic; common very fine and fine and very few medium roots; common fine tubular pores; 15 percent silica films on bottom of rock fragments; 15 percent fine gravel, 30 percent medium and coarse gravel, and 10 percent cobbles; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

Bkq2—39 to 45 centimeters (15 to 18 centimeters); pale brown (10YR 6/3) very gravelly sandy loam, olive brown (2.5Y 4/3) moist; massive; moderately hard, friable; slightly sticky and nonplastic; very few fine roots; 10 percent calcium carbonate coats on bottom of rock fragments; 15 percent medium very pale brown (10YR 8/2) irregular moderately cemented durinodes with clear boundaries in the matrix; 35 percent silica coats on bottom of rock fragments; 25 percent fine gravel, 5 percent medium and coarse gravel, and 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.7); abrupt wavy boundary. (Combined thickness of the Bk horizons is 9 to 30 centimeters)

Bkqm—45 to 70 centimeters (18 to 27.5 inches); light gray (10YR 7/2) indurated (100 percent cementation) duripan, light yellowish brown (2.5Y 6/3) moist; thin laminar cap (1/2 millimeter to 2 millimeters thick); massive; extremely hard; violently effervescent.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 80 degrees F)

*Surface rock fragments:* 80 to 95 percent; including 20 to 80 percent gravel, 15 to 35 percent cobbles, 0 to 25 percent stones, and 0 to 10 percent boulders

*Control section:*

Rock fragments—average of 40 to 60 percent; including 30 to 60 percent gravel and 5 to 20 percent cobbles

Clay content—5 to 12 percent

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of a duripan—36 to 50 centimeters (14 to 20 inches)

*C horizon:*

In lieu of texture—gravel or stones

Rock fragments—80 to 95 percent; including 20 to 80 percent gravel, 15 to 35 percent cobbles, and 0 to 25 percent stones

*A horizon:*

Hue—10YR or 2.5Y

Value—5 or 6 dry; 3 or 4 moist

Chroma—2 or 3, dry or moist

Clay content—4 to 8 percent

Rock fragments—40 to 60 percent; including 30 to 55 percent gravel and 10 to 15 percent cobbles

Effervescence—very slightly to strongly effervescent

Reaction—neutral to moderately alkaline

*Bk or Bkq horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry; 4 or 5 moist

Chroma—1 to 4 dry; 3 or 4 moist

Texture of the fine-earth fraction—sandy loam or fine sandy loam

Clay content—6 to 12 percent

Rock fragments—35 to 65 percent; including 30 to 55 percent gravel and 5 to 20 percent cobbles

Effervescence—slightly to violently effervescent

Calcium carbonate equivalent—1 to 15 percent

Reaction—neutral to strongly alkaline

Visible secondary carbonates—0 to 50 percent as thin coats on bottom of rock fragments

Silica—0 to 25 percent as moderately cemented durinodes in the matrix and 0 to 35 percent as films on bottom of rock fragments

*Bkqm horizon:*

Hue—10YR or 2.5Y

Value—7 or 8 dry; 6 or 7 moist

Chroma—1 or 2 dry; 2 or 3 moist

## Rizzo Series

The Rizzo series consists of very deep, excessively drained soils that formed in alluvium from various igneous and metamorphic rocks. Rizzo soils are on alluvial fans, fan aprons, fan remnants, and inset fans and in drainageways. Slopes range from 0 to 75 percent. The mean annual precipitation is about 75 millimeters (3 inches), and the mean annual air temperature is about 24.5 degrees C (76 degrees F).

### Taxonomic Classification

Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

### Typical Pedon

Rizzo gravelly loamy coarse sand; San Bernardino County, California; on a linear, southwest-facing, 5 percent slope under desert shrubs, approximately 8.6 kilometers (5.3 miles) northwest of the junction of Interstate 10 and Desert Center-Rice Road; 555 meters (1,820 feet) south and 400 meters (1,310 feet) east of the northwest corner of section 12, T. 5 S., R. 14 E., San Bernardino Base and Meridian; at an elevation of 366 meters (1,200 feet); lat. 33 degrees 45 minutes 09.1 seconds N. and long. 115 degrees 28 minutes 46.2 seconds W.; USGS Victory Pass 7.5 minute topographic quadrangle; UTM 11S 0640828e 3735756n (DTM: NAD83). The surface is covered by approximately 20 percent fine gravel, 30 percent medium and coarse gravel, 15 percent cobbles, and 10 percent stones. (Colors are for dry soil unless otherwise noted.)

A—0 to 5 centimeters (0 to 2 inches); pale brown (10YR 6/3) gravelly loamy coarse sand, brown (10YR 4/3) moist; weak fine subangular blocky structure parting to moderate fine granular; soft, very friable; nonsticky and nonplastic; few very fine and fine roots; few fine tubular pores; 5 percent fine gravel, 11 percent medium and coarse gravel, and 4 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 8 centimeters thick)

C1—5 to 23 centimeters (2 to 9 inches); brown (10YR 5/3) very gravelly loamy coarse sand, brown (10YR 4/3) moist; weak medium granular structure; soft, very friable; nonsticky and nonplastic; few very fine and fine roots; few fine tubular pores; 5 percent fine gravel, 20 percent medium and coarse gravel, 12 percent cobbles, and 2 percent stones; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

C2—23 to 48 centimeters (9 to 19 inches); brown (10YR 5/3) very gravelly loamy coarse sand, brown (10YR 4/3) moist; single grain; loose; nonsticky and nonplastic; few very fine and fine roots; few fine interstitial pores; 10 percent fine



gravel, 20 percent medium and coarse gravel, and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.1); gradual wavy boundary.  
Ck—48 to 152 centimeters (19 to 60 inches); light brownish gray (10YR 6/2) very gravelly coarse sand, dark grayish brown (10YR 4/2) moist; single grain; loose; nonsticky and nonplastic; few fine interstitial pores; 1 percent faint white (10YR 8/1) calcium carbonate coats on all surfaces of rock fragments; 18 percent fine gravel, 22 percent medium and coarse gravel, and 12 percent cobbles; strongly effervescent; moderately alkaline (pH 8.1).

#### Range in Characteristics

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some part during winter, summer, and early fall; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (77 to 82 degrees F)

*Surface rock fragments:* 25 to 100 percent; including 10 to 75 percent gravel, 5 to 50 percent cobbles, 0 to 20 percent stones, and 0 to 5 percent boulders

#### *Control section:*

Clay content—1 to 6 percent

Organic matter content—0 to 0.5 percent

Rock fragments—average of 35 to 85 percent; including 25 to 75 percent gravel, 0 to 25 percent cobbles, and 0 to 12 percent stones; more than 50 percent of fragments are medium-sized or larger gravel

#### *A horizon (if it occurs):*

Hue—7.5YR, 10YR, or 2.5Y

Value—5 to 7 dry; 3 to 5 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, loamy sand, loamy fine sand, coarse sandy loam, sandy loam, or fine sandy loam

Clay content—1 to 15 percent

Rock fragments—1 to 80 percent; including 1 to 70 percent gravel, 0 to 25 percent cobbles, and 0 to 12 percent stones

Effervescence—noneffervescent to violently effervescent

Reaction—slightly alkaline or moderately alkaline

Other features—some pedons are characterized by vesicular pores in this horizon

#### *Bw horizon (if it occurs):*

Hue—7.5YR or 10YR

Value—5 to 7 dry; 4 or 5 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—sand, loamy coarse sand, loamy sand, coarse sandy loam, sandy loam, or fine sandy loam

Clay content—1 to 10 percent

Rock fragments—15 to 85 percent; including 15 to 55 percent gravel, 0 to 20 percent cobbles, and 0 to 5 percent stones

Effervescence—noneffervescent to violently effervescent

Reaction—slightly alkaline or moderately alkaline

Note—this horizon is either too thin, is the wrong texture, has insufficient calcium carbonate, or fails to meet some other necessary requirement to be classified as a diagnostic horizon

#### *C, Ck, Ckq, and/or Cq horizons (if they occur):*

Hue—10YR or 2.5Y

Value—5 to 7 dry; 4 to 6 moist

Chroma—2 to 4, dry or moist

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, or loamy sand

Clay content—1 to 6 percent

Rock fragments—25 to 85 percent; including 25 to 75 percent gravel, 0 to 25 percent cobbles, and 0 to 12 percent stones

Effervescence—noneffervescent to violently effervescent

Reaction—slightly alkaline or moderately alkaline

Visible secondary carbonates—0 to 10 percent as coats on rock fragments

Silica—0 to 20 percent as films on rock fragments

## Rockhound Series

The Rockhound series consists of very deep, well drained soils that formed in alluvium from granitoid and/or gneissic rocks. Rockhound soils are on fan remnants. Slopes range from 2 to 15 percent. The mean annual precipitation is about 75 millimeters (3 inches), and the mean annual air temperature is about 24.5 degrees C (76 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids

### Typical Pedon

Rockhound gravel; Riverside County, California; on a south-southeast-facing, linear, 2 percent slope under sparse desert shrubs, approximately 10.5 kilometers (6.5 miles) north-northwest of Desert Center, California, and 2.7 kilometers (1.6 miles) west-southwest of the junction of Eagle Mountain and MWD Aqueduct Roads; 670 meters (2,198 feet) south and 265 meters (869 feet) west of the southeast corner of section 35, T. 4 S., R. 14 E., San Bernardino Base and Meridian; at an elevation of 421 meters (1,381 feet); lat. 33 degrees 46 minutes 40.7 seconds N. and long. 115 degrees 28 minutes 50.3 seconds W.; USGS Victory Pass 7.5 minute topographic quadrangle; UTM 11S 0640681e 3738577n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 4 centimeters (0 to 1.5 inches); gravel; 10 percent fine gravel, 70 percent medium and coarse gravel, 14 percent cobbles, and 1 percent stones; abrupt wavy boundary. (2 to 10 centimeters thick)

A—4 to 9 centimeters (1.5 to 3.5 inches); light brown (7.5YR 6/4) very gravelly loam, brown (7.5YR 4/4) moist; moderate thick platy structure parting to weak medium subangular blocky; slightly hard, very friable; slightly sticky and slightly plastic; few very fine roots; few very fine, fine, medium, and coarse vesicular pores; 15 percent fine gravel, 15 percent medium and coarse gravel, and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.3); clear wavy boundary. (1 to 6 centimeters thick)

Bk—9 to 19 centimeters (3.5 to 7.5 inches); light brown (7.5YR 6/4) very gravelly loam, strong brown (7.5YR 4/6) moist; weak fine subangular blocky structure; slightly hard, very friable; slightly sticky and slightly plastic; few very fine roots; 1 percent prominent very pale brown (10YR 8/2) carbonate coats on bottom of rock fragments; 20 percent fine gravel, 30 percent medium and coarse gravel, and 1 percent cobbles; violently effervescent; moderately alkaline (pH 8.1); abrupt wavy boundary. (0 to 10 centimeters thick)

Btq1—19 to 43 centimeters (7.5 to 17 inches); yellowish red (5YR 4/6) gravelly loam, yellowish red (5YR 4/6) moist; moderate fine and medium subangular blocky structure; moderately hard, friable; moderately sticky and moderately plastic; few very fine and medium roots; 25 percent distinct reddish brown (5YR 4/4) clay films

- on faces of peds; 15 percent prominent very pale brown (10YR 7/3) silica coats on bottom of rock fragments; 15 percent fine gravel, 10 percent medium and coarse gravel, and 1 percent cobbles; slightly alkaline (pH 7.6); gradual wavy boundary.
- Btq2—43 to 87 centimeters (17 to 34 inches); yellowish red (5YR 4/6) extremely gravelly sandy clay loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; moderately hard, friable; moderately sticky and slightly plastic; few very fine and medium roots; 5 percent distinct reddish brown (5YR 4/4) clay films on faces of peds; 15 percent prominent very pale brown (10YR 7/3) silica coats on bottom of rock fragments; 30 percent fine gravel, 30 percent medium and coarse gravel, and 3 percent cobbles; slightly alkaline (pH 7.8); gradual wavy boundary. (Combined thickness of the Bt horizons is 20 to 70 centimeters)
- Bkq1—87 to 114 centimeters (34 to 45 inches); strong brown (7.5YR 4/6) very gravelly sandy loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable; slightly sticky and slightly plastic; few very fine roots; 10 percent prominent very pale brown (10YR 7/3) silica coats on bottom of rock fragments; 25 percent fine gravel and 25 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.
- Bkq2—114 to 152 centimeters (45 to 60 inches); yellowish brown (10YR 5/6) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable; slightly sticky and slightly plastic; 10 percent prominent very pale brown (10YR 7/3) silica coats on bottom of rock fragments; 25 percent fine gravel and 20 percent medium and coarse gravel; strongly effervescent; moderately alkaline (pH 8.1).

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some parts during winter, summer, and early fall; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (77 to 82 degrees F)

*Surface rock fragments:* 90 to 100 percent; including 10 to 20 percent fine gravel, 60 to 78 percent medium and coarse gravel, 5 to 20 percent cobbles, and 1 to 3 percent stones

#### *Control section:*

Rock fragments—average of 40 to 60 percent gravel, cobbles, and stones

Clay content—18 to 25 percent

Organic matter content—0 to 0.25 percent

Depth to the top of an argillic horizon—6 to 20 centimeters (2.5 to 8 inches)

#### *C horizon:*

Rock fragments—90 to 100 percent; including 60 to 80 percent gravel, 10 to 17 percent cobbles, and 1 to 3 percent stones

#### *A horizon:*

Hue—7.5YR or 10YR

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—fine sandy loam, silt loam, or loam

Clay content—8 to 16 percent

Rock fragments—15 to 75 percent; including 10 to 60 percent gravel, 0 to 5 percent cobbles, and 0 to 2 percent stones

Effervescence—slightly to violently effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—slightly alkaline or moderately alkaline

Other features—some pedons are characterized by vesicular pores in this horizon

*Bk(q) horizons:*

Hue—7.5YR or 10YR  
Value—4 to 6 dry; 4 or 5 moist  
Chroma—4 or 6, dry or moist  
Texture of the fine-earth fraction—sandy loam or loam  
Clay content—15 to 20 percent  
Rock fragments—45 to 69 percent; including 45 to 55 percent gravel, 0 to 12 percent cobbles, and 0 to 2 percent stones  
Effervescence—slightly to violently effervescent  
Calcium carbonate equivalent—0 to 10 percent  
Reaction—slightly alkaline or moderately alkaline  
Visible secondary carbonates—0 to 3 percent as coats on rock fragments  
Silica—0 to 5 percent as coats on rock fragments

*Bt, Btq, Btk, and/or Btkq horizons (if they occur):*

Hue—5YR or 7.5YR  
Value—4 or 5 dry  
Chroma—4 or 6, dry or moist  
Texture of the fine-earth fraction—loam or sandy clay loam  
Clay content—18 to 26 percent  
Rock fragments—25 to 65 percent; including 25 to 60 percent gravel, 0 to 15 percent cobbles, and 0 to 3 percent stones  
Effervescence—slightly to violently effervescent  
Calcium carbonate equivalent—0 to 5 percent  
Reaction—slightly alkaline or moderately alkaline  
Visible secondary carbonates—0 to 10 percent as coats on rock fragments  
Silica—0 to 15 percent as coats on rock fragments

*Bkq or Ckq horizon:*

Value—4 to 6 dry; 3 to 5 moist  
Chroma—3 or 4, dry or moist  
Texture of the fine-earth fraction—sand or loamy sand  
Clay content—2 to 20 percent  
Rock fragments—35 to 69 percent; including 35 to 55 percent gravel, 0 to 5 percent cobbles, and 0 to 2 percent stones  
Effervescence—noneffervescent to strongly effervescent  
Calcium carbonate equivalent—0 to 5 percent  
Reaction—slightly alkaline or moderately alkaline  
Visible secondary carbonate—0 to 3 percent as coats on rock fragments  
Silica—0 to 5 percent as films on rock fragments

## Roostertail Series

The Roostertail series consists of deep, well drained soils that formed in eolian deposits from granitoid and/or metamorphic rocks over alluvium from granitoid and/or metamorphic rocks. Roostertail soils are on fan remnants. Slopes range from 0 to 4 percent. The mean annual precipitation is about 75 millimeters (3 inches), and the mean annual air temperature is about 25 degrees C (77 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Duric Petroargids

### Typical Pedon

Roostertail very gravelly fine sandy loam; Riverside County, California; on an east-southeast-facing, linear, 1 percent slope under sparse desert shrubs, approximately

1.68 kilometers (1 mile) northwest of the junction of Desert Center-Rice and MWD Aqueduct Roads along the MWD Aqueduct Road and approximately 10 meters (33 feet) south of the MWD Aqueduct Road; 245 meters (805 feet) east and 530 meters (1,738 feet) north of the southwest corner of section 21, T. 4 S., R. 16 E., San Bernardino Base and Meridian; at an elevation of 174 meters (572 feet); lat. 33 degrees 48 minutes 23.8 seconds N. and long. 115 degrees 18 minutes 47.4 seconds W.; USGS East of Victory Pass 7.5 minute topographic quadrangle; UTM 11S 0656139e 3741989n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 2 centimeters (0 to 1 inch); gravel; approximately 50 percent fine gravel, 45 percent medium and coarse gravel, and 2 percent cobbles; abrupt wavy boundary. (1 to 11 centimeters thick)

A—2 to 6 centimeters (1 to 2.5 inches); light brown (7.5YR 6/3) very gravelly fine sandy loam, brown (7.5YR 4/3) moist; moderate thick platy structure; soft, very friable; nonsticky and nonplastic; few very fine roots; many very fine and few fine and medium vesicular pores; 10 percent fine gravel and 30 percent medium and coarse gravel; violently effervescent (8 percent calcium carbonate equivalent); moderately alkaline (pH 8.1); abrupt smooth boundary. (2 to 5 centimeters thick)

2Btkq1—6 to 10 centimeters (2.5 to 4 inches); strong brown (7.5YR 5/6) extremely gravelly sandy loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine roots; few very fine interstitial pores; 15 percent faint strong brown (7.5YR 4/6) clay films on faces of peds; 25 percent distinct yellowish brown (10YR 5/6) silica coats on bottom of rock fragments; 15 percent fine gravel and 50 percent medium and coarse gravel; violently effervescent (8 percent calcium carbonate equivalent); slightly alkaline (pH 7.5); clear wavy boundary.

2Btkq2—10 to 30 centimeters (4 to 12 inches); strong brown (7.5YR 5/6) very gravelly sandy loam, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; few very fine irregular pores; 3 percent faint strong brown (7.5YR 4/6) clay films on faces of peds; 2 percent fine prominent very pale brown (10YR 8/2) clear irregular calcium carbonate masses in the matrix and 3 percent fine prominent very pale brown (10YR 8/2) moderately cemented calcium carbonate nodules in the matrix with sharp boundaries; 5 percent distinct yellowish brown (10YR 5/6) silica coats on bottom of rock fragments; 15 percent fine gravel and 30 percent medium and coarse gravel; violently effervescent (7 percent calcium carbonate equivalent); moderately alkaline (pH 8.0); clear wavy boundary.

2Btkq3—30 to 73 centimeters (12 to 28.5 inches); light brown (7.5YR 6/3) very gravelly sandy loam, brown (7.5YR 5/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable; nonsticky and nonplastic; few very fine and fine interstitial pores; 3 percent distinct strong brown (7.5YR 4/6) clay films on faces of peds; 10 percent medium prominent very pale brown (10YR 8/2) irregular calcium carbonate masses in the matrix with clear boundaries, 5 percent medium prominent very pale brown (10YR 8/2) calcium carbonate masses on bottom of rock fragments, and 10 percent medium prominent very pale brown (10YR 8/2) weakly cemented calcium carbonate nodules in the matrix; 20 percent prominent irregular yellowish brown (10YR 5/4) silica masses on bottom of rock fragments; 40 percent medium and coarse gravel; violently effervescent (6.5 percent calcium carbonate equivalent); neutral (pH 7.3); gradual wavy boundary. (Combined thickness of the Btkq horizons is 65 to 96 centimeters)

2Bkq—73 to 142 centimeters (28.5 to 56 inches); light brown (7.5YR 6/3) gravelly sand, brown (7.5YR 5/3) moist; single grain; loose; nonsticky and nonplastic; 3 percent fine prominent very pale brown (10YR 8/2) moderately cemented calcium carbonate nodules in the matrix with sharp boundaries; 25 percent distinct yellowish brown (10YR 5/6) silica coats on bottom of rock fragments and 20



percent prominent irregular yellowish brown (10YR 5/6) silica masses on bottom of rock fragments; 20 percent fine gravel and 10 percent medium and coarse gravel; very slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (0 to 80 centimeters thick)

2Bkqm—142 to 152 centimeters (56 to 60 inches); white (10YR 8/1) nearly continuous, strongly cemented duripan (gravelly sand when crushed and sieved), light gray (10YR 7/2) moist; massive; rigid; nonsticky and nonplastic; violently effervescent (35 percent calcium carbonate equivalent); moderately alkaline (pH 8.3); abrupt smooth boundary. (10 to 25 centimeters thick)

3Bk—152 to 175 centimeters (60 to 70 inches); pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; massive; moderately hard, friable; nonsticky and nonplastic; very few very fine irregular pores; 3 percent fine prominent very pale brown (10YR 8/2) moderately cemented calcium carbonate nodules in the matrix with sharp boundaries; violently effervescent (3 percent calcium carbonate equivalent); moderately alkaline (pH 8.3).

#### Range in Characteristics

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some part during winter, summer, and early fall; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 25 to 28 degrees C (77 to 82 degrees F)

*Surface rock fragments:* 95 to 100 percent; including 15 to 75 percent fine gravel, 15 to 50 percent medium and coarse gravel, 1 to 30 percent cobbles, and 0 to 15 percent stones

#### *Control section:*

Rock fragments—average of 40 to 60 percent; gravel, cobbles, and stones

Clay content—average of 10 to 18 percent

Organic matter content—0 to 0.25 percent

Depth to the upper boundary of an argillic horizon—3 to 25 centimeters (1 to 10 inches)

Depth to the upper boundary of a calcic horizon—6 to 10 centimeters (2 to 4 inches)

Depth to the upper boundary of a duripan—100 to 150 centimeters (40 to 60 inches)

#### *C horizon:*

Rock fragments—95 to 100 percent; including 15 to 75 percent fine gravel, 15 to 50 percent medium and coarse gravel, 1 to 30 percent cobbles, and 0 to 15 percent stones

#### *A horizon:*

Hue—7.5YR or 10YR

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy fine sand, sandy loam, or fine sandy loam

Clay content—5 to 15 percent

Rock fragments—15 to 75 percent; including 10 to 60 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Calcium carbonate equivalent—5 to 10 percent

Reaction—slightly alkaline or moderately alkaline

Other features—some horizons are characterized by vesicular pores in this horizon

#### *(2)Btk or (2)Btkq horizons:*

Hue—5YR or 7.5YR

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 to 6, dry or moist  
Texture of the fine-earth fraction—coarse sandy loam, sandy loam, or loam  
Clay content—8 to 18 percent  
Rock fragments—40 to 65 percent; including 40 to 65 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones  
Effervescence—very slightly to violently effervescent  
Calcium carbonate equivalent—5 to 10 percent  
Reaction—neutral to moderately alkaline  
Visible secondary carbonates—0 to 5 percent as coats on rock fragments and 0 to 15 percent as nodules or masses within the matrix  
Silica—0 to 30 percent as masses or coats on bottom of rock fragments

*(2)Bk, (2)Bkq, (2)Bkqm, and/or (3)Bk horizons (if they occur):*

Hue—7.5YR or 10YR  
Value—6 to 8 dry; 4 to 7 moist  
Chroma—1 to 4 dry; 2 to 4 moist  
Texture of the fine-earth fraction—sand, fine sand, or loamy coarse sand  
Clay content—1 to 8 percent  
Rock fragments—0 to 75 percent; including 0 to 60 percent gravel and 0 to 15 percent cobbles  
Effervescence—very slightly to violently effervescent  
Calcium carbonate equivalent—0 to 35 percent  
Reaction—slightly alkaline or moderately alkaline  
Visible secondary carbonates—0 to 5 percent as coats on rock fragments and 0 to 15 percent as nodules or masses within the matrix  
Silica—0 to 30 percent as masses or coats on bottom of rock fragments  
Cementation—noncemented to strongly cemented matrix

## Rubylee Series

The Rubylee series consists of very deep, well drained soils that formed in alluvium from granitoid and/or gneissic rocks. Rubylee soils are on fan remnants. Slopes range from 1 to 15 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Coarse-loamy, mixed, superactive, hyperthermic Typic Haplargids

### Typical Pedon

Rubylee fine sandy loam; Riverside County, California; on a linear, 2 percent slope under desert shrubs, about 16.6 kilometers (10.3 miles) northeast of the junction of Pintobasin and Old Dale Roads in Joshua Tree National Park; 225 meters (738 feet) east and 330 meters (1,082 feet) south of the northwest corner of section 9, T. 3 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 453 meters (1,485 feet); lat. 33 degrees 55 minutes 34.4 seconds N. and long. 115 degrees 37 minutes 21.0 seconds W.; USGS Placer Canyon 7.5 minute topographic quadrangle; UTM 11S 0627322e 3754831n (DTM: NAD83). The surface is covered by approximately 15 percent fine gravel, 50 percent medium and coarse gravel, 10 percent cobbles, and 3 percent stones. (Colors are for dry soil unless otherwise noted.)

A—0 to 5 centimeters (0 to 2 inches); light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 3/4) moist; moderate thick platy structure parting to moderate fine subangular blocky; slightly hard, very friable; slightly sticky and nonplastic; very few very fine roots; common very fine and few fine

vesicular pores; 2 percent fine gravel and 1 percent medium and coarse gravel; violently effervescent; moderately alkaline (pH 7.9); clear wavy boundary. (2 to 5 centimeters thick)

Bt—5 to 12 centimeters (2 to 5 inches); light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/6) moist; weak fine subangular blocky structure; slightly hard, very friable; slightly sticky and nonplastic; common very fine tubular pores; 5 percent distinct strong brown (7.5YR 4/6) clay bridging between sand grains; 20 percent fine gravel, 12 percent medium and coarse gravel, and 2 percent cobbles; violently effervescent; moderately alkaline (pH 7.9); clear wavy boundary.

Btkq—12 to 45 centimeters (5 to 18 inches); strong brown (7.5YR 4/6) gravelly sandy loam, strong brown (7.5YR 4/6) moist; moderate fine subangular blocky structure; moderately hard, friable; slightly sticky and nonplastic; very few very fine roots; very few fine interstitial pores; 5 percent faint strong brown (7.5YR 4/6) clay films on faces of peds and 30 percent distinct strong brown (7.5YR 4/6) clay bridging between sand grains; 10 percent prominent white (10YR 8/1) calcium carbonate coats on surfaces lining pores and 2 percent prominent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; 3 percent prominent very pale brown (10YR 7/3) silica films on bottom of rock fragments; 12 percent fine gravel, 6 percent medium and coarse gravel, and 3 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (Combined thickness of the Bt horizons is 24 to 45 centimeters)

Bkq—45 to 152 centimeters (18 to 60 inches); dark yellowish brown (10YR 4/6) gravelly loamy sand, dark yellowish brown (10YR 3/6) moist; massive; soft, very friable; nonsticky and nonplastic; 10 percent prominent white (10YR 8/1) calcium carbonate coats on bottom of rock fragments; 4 percent prominent very pale brown (10YR 7/3) silica films on bottom of rock fragments; 15 percent fine gravel, 10 percent medium and coarse gravel, and 5 percent cobbles; very slightly effervescent; slightly alkaline (pH 7.7).

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 20 to 78 percent; including 20 to 75 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

#### *Control section:*

Rock fragments—1 to 30 percent; dominantly gravel

Clay content—10 to 18 percent

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of an argillic horizon—5 to 25 centimeters (2 to 10 inches)

#### *A horizon:*

Value—5 to 7 dry; 3 to 5 moist

Chroma—3 or 4 dry; 2 to 6 moist

Texture of the fine-earth fraction—fine sand, loamy fine sand, sandy loam, or fine sandy loam

Clay content—1 to 15 percent

Rock fragments—3 to 60 percent gravel

Effervescence—noneffervescent to violently effervescent

Reaction—neutral to moderately alkaline

*Bw horizon (if it occurs):*

Hue—7.5YR or 10YR  
Value—5 or 6 dry; 3 or 4 moist  
Chroma—3 to 6 dry; 4 to 6 moist  
Texture of the fine-earth fraction—fine sand or sandy loam  
Clay content—3 to 12 percent  
Rock fragments—1 to 10 percent gravel  
Effervescence—noneffervescent to violently effervescent  
Reaction—neutral to moderately alkaline

*Bt and Btkq horizons:*

Hue—7.5YR or 10YR  
Value—4 to 7 dry; 4 or 5 moist  
Chroma—4 to 6, dry or moist  
Texture of the fine-earth fraction—sandy loam or fine sandy loam  
Clay content—10 to 18 percent  
Rock fragments—1 to 35 percent; including 1 to 35 percent gravel and 0 to 3 percent cobbles  
Effervescence—very slightly to violently effervescent  
Calcium carbonate equivalent—0 to 1 percent  
Reaction—slightly alkaline or moderately alkaline  
Visible secondary carbonates—0 to 15 percent as masses or coats on rock fragments  
Silica—0 to 10 percent as films on rock fragments

*Bkq horizon:*

Hue—7.5YR or 10YR  
Value—4 to 7 dry; 3 to 6 moist  
Chroma—2 to 6 dry; 3 to 6 moist  
Texture of the fine-earth fraction—sand, loamy sand, or sandy loam  
Clay content—3 to 16 percent  
Rock fragments—1 to 50 percent; including 1 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 3 percent stones  
Effervescence—very slightly to violently effervescent  
Calcium carbonate equivalent—0 to 1 percent  
Reaction—slightly alkaline to strongly alkaline  
Visible secondary carbonates—0 to 25 percent as masses or coats on rock fragments  
Silica—0 to 15 percent as films on rock fragments and 0 to 20 percent as moderately cemented durinodes

## **Russiroks Series**

The Russiroks series consists of very deep, well drained soils that formed in alluvium derived from igneous and metamorphic rocks. Russiroks soils are on fan remnants. Slopes range from 2 to 4 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### **Taxonomic Classification**

Loamy-skeletal, mixed, superactive, hyperthermic Typic Calciargids

### **Typical Pedon**

Russiroks gravel; Riverside County, California; on a convex, east-facing, 4 percent slope under sparse creosote bush, about 6.65 kilometers (4.1 miles) northeast of

the junction of Highway 177 and MWD Aqueduct Road along Highway 177 and 475 meters (1,158 feet) west of Highway 177; about 6 meters (20 feet) south and 208 meters (683 feet) east of the northwest corner of section 12, T. 4 S., R. 16 E., San Bernardino Base and Meridian; at an elevation of 182 meters (597 feet); lat. 33 degrees 50 minutes 43.8 seconds N. and long. 115 degrees 15 minutes 36.28 seconds W.; USGS East of Victory Pass 7.5 minute topographic quadrangle; UTM 11S 0660977e 3746387n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

- C—0 to 3 centimeters (0 to 1 inch); gravel; 20 percent fine gravel, 70 percent medium and coarse gravel, and 5 percent cobbles; abrupt wavy boundary. (2 to 5 centimeters thick)
- A—3 to 6 centimeters (1 to 2.5 inches); light yellowish brown (10YR 6/4) gravelly silt loam, brown (7.5YR 4/4) moist; strong very thick platy structure; moderately hard, friable; nonsticky and slightly plastic; common very fine and few fine and medium vesicular pores; 5 percent fine gravel and 10 percent medium and coarse gravel; slightly effervescent; moderately alkaline (pH 8.1); clear wavy boundary. (2 to 5 centimeters thick)
- 2Btkq—6 to 19 centimeters (2.5 to 7.5 inches); light brown (7.5YR 6/4) very gravelly loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable; nonsticky and slightly plastic; few very fine interstitial pores; 5 percent distinct strong brown (7.5YR 4/6) clay films on faces of peds; 3 percent prominent light gray (10YR 7/2) silica coats and 5 percent prominent fine light gray (10YR 7/2) irregular silica masses on bottom of rock fragments with clear boundaries; 20 percent fine gravel, 15 percent medium and coarse gravel, and 3 percent cobbles; strongly effervescent (calcium carbonate equivalent of 5 percent); moderately alkaline (pH 8.2); clear wavy boundary. (10 to 40 centimeters thick)
- 2Bkq1—19 to 75 centimeters (7.5 to 29.5 inches); light brownish gray (2.5Y 6/2) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable; nonsticky and nonplastic; 5 percent prominent very pale brown (10YR 8/2) calcium carbonate coats on bottom of rock fragments; 15 percent distinct very pale brown (10YR 8/2) coarse irregular very weakly cemented durinodes in the matrix; 3 percent distinct light gray (10YR 7/2) silica coats and 5 percent distinct fine light gray (10YR 7/2) irregular silica masses on bottom of rock fragments with clear boundaries; 15 percent fine gravel, 45 percent medium and coarse gravel, 5 percent cobbles, and 5 percent stones; violently effervescent (calcium carbonate equivalent of 9 percent); moderately alkaline (pH 8.4); clear wavy boundary.
- 2Bkq2—75 to 150 centimeters (29.5 to 59 inches); light brownish gray (2.5Y 6/2) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable; nonsticky and nonplastic; 5 percent prominent very pale brown (10YR 8/2) calcium carbonate coats on bottom of rock fragments; 10 percent distinct light gray (10YR 7/2) coarse irregular very weakly cemented durinodes in the matrix; 3 percent distinct light gray (10YR 7/2) silica coats and 5 percent distinct fine light gray (10YR 7/2) irregular silica masses on bottom of rock fragments with clear boundaries; 20 percent fine gravel, 50 percent medium and coarse gravel, 5 percent cobbles, and 5 percent stones; violently effervescent (calcium carbonate equivalent of 7 percent); strongly alkaline (pH 8.6).

#### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 90 to 100 percent; including 75 to 90 percent gravel, 5 to 20 percent cobbles, and 0 to 3 percent stones



## Soil Survey of Joshua Tree National Park, California

### *Control section:*

Clay content—10 to 18 percent  
Rock fragments—40 to 70 percent; including 20 to 65 percent gravel, 5 to 15 percent cobbles, and 0 to 10 percent stones  
Organic matter content—0 to 0.5 percent  
Depth to the top of an argillic horizon—6 to 10 centimeters (2.5 to 4 inches)  
Depth to the top of a calcic horizon—6 to 30 centimeters (2.5 to 12 inches)

### *C horizon:*

Rock fragments—90 to 100 percent; including 75 to 90 percent gravel, 5 to 20 percent cobbles, and 0 to 3 percent stones

### *A horizon:*

Hue—7.5YR or 10YR  
Value—6 or 7 dry  
Chroma—3 or 4 dry  
Clay content—12 to 18 percent  
Rock fragments—15 to 30 percent; including 15 to 30 percent gravel and 0 to 5 percent cobbles  
Effervescence—slightly to strongly effervescent  
Calcium carbonate equivalent—0 to 5 percent  
Reaction—moderately alkaline or strongly alkaline

### *2Btk or 2Btkq horizon:*

Value—6 or 7 dry; 4 or 5 moist  
Chroma—3 or 4 dry  
Texture of the fine-earth fraction—sandy loam or loam  
Clay content—12 to 18 percent  
Rock fragments—35 to 55 percent; including 20 to 45 percent gravel, 3 to 10 percent cobbles, and 0 to 5 percent stones  
Effervescence—strongly or violently effervescent  
Calcium carbonate equivalent—5 to 15 percent  
Reaction—slightly alkaline to strongly alkaline  
Visible secondary carbonates—0 to 15 percent as coats on rock fragments and 0 to 25 percent as masses within the matrix  
Silica—0 to 30 percent as coats or masses on rock fragments and 0 to 5 percent as weakly cemented durinodes less than 2 millimeters in size within the matrix  
Salinity—0 to 4 dS/m

### *2Bk or 2Bkq horizon:*

Hue—10YR or 2.5Y  
Value—6 or 7 dry  
Chroma—2 or 3 moist  
Texture of the fine-earth fraction—loamy sand or sandy loam  
Clay content—6 to 12 percent  
Rock fragments—65 to 80 percent; including 45 to 70 percent gravel, 5 to 15 percent cobbles, and 2 to 10 percent stones  
Calcium carbonate equivalent—5 to 15 percent in the upper part of horizon and 0 to 7 percent in the lower part  
Reaction—moderately alkaline or strongly alkaline  
Visible secondary carbonates—5 to 50 percent as coats on rock fragments and 0 to 15 percent as masses within the matrix  
Silica—0 to 25 percent as coats or masses on rock fragments and 0 to 15 percent as weakly to moderately cemented durinodes within the matrix  
Salinity—0 to 4 dS/m

## Seanna Series

The Seanna series consists of very shallow and shallow, well drained soils that formed in residuum derived from granitic rocks. Seanna soils are on hills and mountains. Slopes range from 8 to 50 percent. The mean annual precipitation is about 6 inches, and the mean annual air temperature is about 67 degrees F.

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, calcareous, thermic, shallow Typic Torriorthents

### Typical Pedon

Seanna extremely gravelly sandy loam, rangeland and wildlife habitat; Clark County, Nevada; approximately 4.5 miles southeast of the intersection of U.S. Highway 95 and State Highway 60, located on the west side of the El Dorado Mountains; about 2,190 feet north and 690 feet west of the southeast corner of section 14, T. 25 S., R. 63 E.; lat. 35 degrees 46 minutes 11 seconds N. and long. 114 degrees 54 minutes 13 seconds W.; USGS Boulder City SW, Nevada 7.5 minute topographic quadrangle; UTM 11 689503e 3960436n (DTM: NAD83). The surface is covered by approximately 85 percent pebbles. (Colors are for dry soil unless otherwise noted.)

A—0 to 2 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure parting to weak fine granular; soft, very friable; nonsticky and nonplastic; common very fine roots; few very fine interstitial pores; 80 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (1 to 3 inches thick)

Bk1—2 to 6 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable; slightly sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; few fine calcium carbonate coats on underside of rock fragments; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk2—6 to 10 inches; light brown (7.5YR 6/4) very gravelly sandy loam, brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable; slightly sticky and slightly plastic; common very fine and few fine roots; few very fine tubular pores; few fine calcium carbonate coats on underside of rock fragments; 50 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt irregular boundary. (Combined thickness of the Bk horizons is 6 to 12 inches)

Crt—10 to 20 inches; highly fractured granitic bedrock; distinct clay coats in fractures on rock fragments.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July to October following summer convection storms

*Soil temperature:* 66 to 71 degrees F

*Depth to paralithic contact:* 7 to 14 inches

*Depth to base of paralithic material:* 20 to 40 inches

*Control section:*

Clay content—8 to 18 percent

Rock fragments—average of 35 to 60 percent; 30 to 60 percent of the rock fragments are 2- to 5-millimeter gravel

*A horizon:*

Value—5 or 6 dry

*Bk horizon:*

Value—6 or 7 dry

Chroma—3 or 4 moist

Structure—granular or subangular blocky

In map units 1241 and 3340, the Seanna soils are considered a taxadjunct to the series. These soils differ from the Seanna series because they have more rock fragments that are less than strongly cemented. The high amount of weakly cemented rock fragments increases the water-holding capacity of the soils but, due to the steep slopes on which these soils occur, this does not affect use and management.

## Sheephole Series

The Sheephole series consists of very deep, somewhat excessively drained soils that formed in eolian material over alluvium from granitoid or other igneous rocks. Sheephole soils are on thin sand sheets overlying fan remnants, fan aprons, and alluvial fans. Slopes range from 2 to 8 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Sandy, mixed, hyperthermic Typic Torriorthents

### Typical Pedon

Sheephole fine sand; San Bernardino County, California; on a northwest-facing, convex, 5 percent slope under desert shrubs, approximately 3.6 kilometers east and 650 feet south of the junction of Highway 62 and Iron Age Road along Highway 62; about 2,330 meters (7,644 feet) south and 218 meters (715 feet) east of the southwest corner of section 32, T. 1 N., R. 13 E., San Bernardino Base and Meridian; at an elevation of 473 meters (1,552 feet); lat. 34 degrees 06 minutes 03.0 seconds N. and long. 115 degrees 38 minutes 52.9 seconds W.; USGS New Dale 7.5 minute topographic quadrangle; UTM 11S 0624710e 3774162n (DTM: NAD83). The surface is covered by approximately 10 percent fine gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 4 centimeters (0 to 1.5 inches); light yellowish brown (10YR 6/4) fine sand, yellowish brown (10YR 5/4) moist; weak thin platy structure; soft, very friable; nonsticky and nonplastic; few very fine roots; 2 percent fine gravel; neutral (pH 6.6); clear wavy boundary. (2 to 5 centimeters thick)

Bw—4 to 15 centimeters (1.5 to 6 inches); light yellowish brown (10YR 6/4) fine sand, yellowish brown (10YR 5/4) moist; massive parting to weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; many very fine and few fine roots; 2 percent fine gravel; slightly acid (pH 6.4); gradual wavy boundary. (0 to 30 centimeters thick)

Bk1—15 to 55 centimeters (6 to 22 inches); light yellowish brown (10YR 6/4) fine sand, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine and fine roots; 1 percent distinct light gray (10YR 7/2) calcium carbonate coats on bottom of rock fragments; 3 percent fine gravel; slightly alkaline (pH 7.4); gradual wavy boundary.

Bk2—55 to 74 centimeters (22 to 29 inches); light yellowish brown (10YR 6/4) fine sand, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; few fine and medium roots; 1 percent distinct light gray (10YR 7/2) calcium carbonate coats on bottom of rock fragments; 3 percent fine gravel, 5 percent medium and coarse gravel, and 2 percent cobbles;

very slightly effervescent; moderately alkaline (pH 8.0); abrupt irregular boundary.  
(Combined thickness of the Bk horizons is 20 to 60 centimeters)

- 2Ckq—74 to 107 centimeters (29 to 42 inches); light yellowish brown (10YR 6/4)  
extremely cobbly fine sand, yellowish brown (10YR 5/4) moist; single grain; loose;  
nonsticky and nonplastic; few medium roots; 2 percent distinct light gray (10YR  
7/2) calcium carbonate coats on rock fragments; 2 percent distinct light gray (10YR  
7/2) silica coats on rock fragments; 10 percent very fine gravel, 15 percent medium  
and coarse gravel, and 35 percent cobbles; slightly effervescent; moderately  
alkaline (pH 8.0); abrupt irregular boundary. (30 to 50 centimeters thick)
- 3C—107 to 150 centimeters (42 to 59 inches); light yellowish brown (10YR 6/4)  
fine sand, yellowish brown (10YR 5/4) moist; single grain; loose; nonsticky and  
nonplastic; 5 percent fine gravel; very slightly effervescent; moderately alkaline  
(pH 8.2).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during  
winter and early spring and for 10 to 20 days (cumulative) between July and  
September following convection storms; the soils have a typic-aridic soil moisture  
regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 5 to 70 percent; including 5 to 70 percent gravel and 0 to 5  
percent cobbles

#### *Control section:*

Rock fragments—average of 8 to 35 percent; ranging from 0 to 15 percent in  
the eolian deposits and from 10 to 75 percent in the alluvial deposits; 35 to 75  
percent rock fragments in one or more horizons

Clay content—1 to 5 percent

Organic matter content—0 to 0.5 percent

#### *A horizon:*

Value—4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—fine sand or loamy fine sand

Clay content—1 to 5 percent

Rock fragments—2 to 25 percent; including 0 to 25 percent gravel and 0 to 5  
percent cobbles

Reaction—neutral to moderately alkaline

#### *Bw horizon (if it occurs):*

Value—6 or 7 dry; 5 or 6 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—fine sand, very fine sand, or loamy fine sand

Clay content—1 to 5 percent

Rock fragments—0 to 5 percent gravel

Reaction—neutral to moderately alkaline

#### *Bk horizon:*

Value—5 or 6 dry

Chroma—5 or 6 dry

Clay content—1 to 5 percent

Rock fragments—0 to 15 percent; including 0 to 15 percent gravel and 0 to 5  
percent cobbles

Reaction—neutral to strongly alkaline

#### *2Ckq horizon:*

Value—6 or 7 dry; 5 or 6 moist

Chroma—3 to 6 dry; 3 or 4 moist

Texture of the fine-earth fraction—coarse sand, sand, fine sand, or loamy sand

Clay content—1 to 5 percent

Rock fragments—35 to 75 percent; including 10 to 50 percent gravel and 0 to 35 percent cobbles

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline to strongly alkaline

*3C horizon (if it occurs):*

Value—6 or 7 dry; 5 or 6 moist

Chroma—3 to 6 dry; 3 or 4 moist

Clay content—1 to 5 percent

Rock fragments—0 to 5 percent gravel

Calcium carbonate equivalent—0 to 5 percent

Effervescence—very slightly to strongly effervescent

Reaction—slightly alkaline to strongly alkaline

## Silvermine Series

The Silvermine series consists of very shallow and shallow, somewhat excessively drained soils that formed in mixed alluvium. Silvermine soils are on fan aprons and alluvial fans over fan remnants. Slopes range from 2 to 8 percent. The mean annual precipitation is about 100 millimeters, and the mean annual air temperature is about 19 degrees C.

### Taxonomic Classification

Sandy, mixed, thermic, shallow Cambidic Haplodurids

### Typical Pedon

Silvermine gravelly sandy loam; San Bernardino County, California; on a linear, 6 percent slope, approximately 9.6 kilometers north and 1.6 kilometers west of Means Lake; 1,100 meters due south of the northwest corner of section 22, T. 5 N., R. 4 E.; at an elevation of 975 meters; lat. 34 degrees 30 minutes 14.0 seconds N. and long. 116 degrees 33 minutes 28.0 seconds W.; USGS Iron Ridge 7.5 minute topographic quadrangle; UTM 11S 540597e 3818111n (DTM: NAD83). The surface is covered by approximately 50 percent gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 3 centimeters; light yellowish brown (10YR 6/4) gravelly sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable; nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; strongly effervescent; 1 percent calcium carbonate equivalent; 20 percent gravel; slightly alkaline (pH 7.4); clear wavy boundary. (3 to 5 centimeters thick)

AB—3 to 26 centimeters; pale brown (10YR 6/3) gravelly sand, brown (10YR 4/3) moist; massive; soft, very friable; nonsticky and nonplastic; many very fine roots; common very fine tubular pores; strongly effervescent; 6 percent calcium carbonate equivalent; 25 percent gravel; moderately alkaline (pH 8.0); clear wavy boundary. (10 to 47 centimeters thick)

Bkqm1—26 to 69 centimeters; white (10YR 8/1) strongly cemented duripan with 0.5- to 1-millimeter discontinuous laminar cap, light gray (10YR 7/2) moist; coarse thick platy structure; extremely hard, slightly rigid, brittle; many very fine, common fine, and few medium roots matted at the top of horizon; common very fine and few fine tubular pores; violently effervescent; gradual wavy boundary. (23 to 60 centimeters thick)

Bkqm2—69 to 124 centimeters; very pale brown (10YR 7/3) very weakly to strongly cemented duripan, light yellowish brown (10YR 6/4) moist; massive; very hard,



very firm, brittle; 20 percent gravelly loamy sand in fractures 10 to 20 centimeters apart; common very fine and fine roots in fractures; 30 percent gravel; violently effervescent; clear wavy boundary. (Combined thickness of the Bkqm horizons is more than 50 centimeters)

Bkq—124 to 150 centimeters; very pale brown (10YR 8/3) gravelly loamy sand, brownish yellow (10YR 6/6) moist; massive; slightly hard, very friable; nonsticky and nonplastic; common very fine and fine roots; 3 percent medium distinct white (10YR 8/1) irregular durinodes in the matrix; 15 percent fine faint white (2.5Y 8/1) calcium carbonate threads throughout the matrix; violently effervescent; 20 percent gravel; strongly alkaline (pH 8.6).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and October following convection storms; the soils have a typic-aridic moisture regime

*Soil temperature:* 19 to 22 degrees C

*Depth to duripan:* 15 to 50 centimeters

*Organic matter content:* 0 to 0.5 percent

*Surface rock fragments:* 30 to 55 percent; including 30 to 50 percent gravel and 0 to 5 percent cobbles

#### *Control section:*

Rock fragments—15 to 30 percent; dominantly gravel

Clay content—4 to 8 percent

Calcium carbonate equivalent—1 to 10 percent

#### *A horizon:*

Value—6 or 7 dry

Chroma—3 or 4 moist

Texture—sandy loam or loamy sand

Clay content—5 to 10 percent

Rock fragments—15 to 20 percent; dominantly gravel

Effervescence—strongly or violently effervescent

Calcium carbonate equivalent—1 to 5 percent

Reaction—slightly alkaline or moderately alkaline

#### *AB horizon:*

Value—6 or 7 dry

Chroma—3 to 6, dry or moist

Texture—sand or loamy sand

Clay content—2 to 8 percent

Rock fragments—15 to 25 percent; dominantly gravel

Effervescence—strongly or violently effervescent

Calcium carbonate equivalent—1 to 10 percent

#### *Bkqm horizon:*

Cementation—very weakly to strongly cemented

#### *Bkq horizon:*

Value—6 or 7 dry; 4 or 5 moist

Chroma—4 or 6, dry or moist

Texture—loamy sand or sand

Clay content—2 to 8 percent

Rock fragments—5 to 50 percent; dominantly gravel

Calcium carbonate equivalent—5 to 15 percent

Durinodes—3 to 20 percent

## Smithcanyon Series

The Smithcanyon series consists of very shallow and shallow, somewhat excessively drained soils that formed in colluvium over residuum derived from granitoid and/or gneissic rocks. Smithcanyon soils are on hills and mountains. Slopes range from 8 to 75 percent. The mean annual precipitation is about 200 millimeters (8 inches), and the mean annual air temperature is about 15 degrees C (59 degrees F).

### Taxonomic Classification

Mixed, thermic, shallow Xeric Torripsamments

### Typical Pedon

Smithcanyon sand (fig. 78); San Bernardino County, California; on a 57 percent slope under desert shrubs, approximately 200 meters south of Big Morongo Canyon Road; approximately 50 meters east and 210 meters north of the southwest corner of section 16, T. 1 S., R. 4 E.; at an elevation of 988 meters; lat. 34 degrees 04 minutes 40 seconds N. and long. 116 degrees 34 minutes 36.7 seconds W.; USGS Morongo Valley, California 7.5 minute topographic quadrangle; UTM 11S 538733 3770845n (DTM: NAD83). The surface is covered by 5 percent fine gravel, 70 percent medium and coarse gravel, and 2 percent cobbles. (When described, the soil was dry throughout.)

- A—0 to 7 centimeters (0 to 3 inches); light brownish gray (10YR 6/2) sand, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; common fine roots throughout; very few very fine tubular pores; 5 percent fine and 5 percent medium to coarse gravel; neutral (pH 7.2); clear wavy boundary. (2 to 13 centimeters thick)
- Cr—7 to 150 centimeters (3 to 60 inches); weathered, fractured, extremely weakly cemented granitoid bedrock; low excavation difficulty; very few very fine roots in cracks that are more than 10 centimeters apart.

### Range in Characteristics

*Soil moisture control section:* Usually dry from May 1 to November 30 and moist in some or all parts the rest of the year; the soils have an aridic soil moisture regime bordering on xeric

*Soil temperature:* 15 to 19 degrees C (59 to 66 degrees C)

*Surface rock fragments:* 35 to 80 percent; dominantly fine gravel

#### *Control section:*

- Clay content—2 to 6 percent
- Organic matter content—0.25 to 1 percent
- Rock fragments—5 to 30 percent; including 0 to 5 percent cobbles in the lower part of control section
- Depth to paralithic contact—7 to 35 centimeters (3 to 14 inches)
- Effervescence—noneffervescent throughout

#### *A horizon:*

- Value—4 to 6 dry; 2 to 5 moist
- Chroma—2 to 4, dry or moist
- Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand
- Clay content—2 to 6 percent
- Rock fragments—3 to 32 percent; including 5 to 32 percent gravel and 0 to 10 percent cobbles
- Reaction—slightly acid to slightly alkaline

#### *Bw horizon (if it occurs):*

- Value—4 or 5 dry; 3 to 5 moist



Figure 78.—The modal location for the Smithcanyon soils in the park. (Scale is in centimeters.)

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand

Clay content—2 to 6 percent

Rock fragments—7 to 33 percent; including 7 to 30 percent gravel and 0 to 5 percent cobbles

Reaction—slightly acid to slightly alkaline

*C horizon (if it occurs):*

Value—4 or 6 dry; 3 to 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—1 to 6 percent

Rock fragments—7 to 34 percent; including 0 to 30 percent indurated gravel, 0 to 10 percent indurated cobbles, and 0 to 15 percent paragravel  
Reaction—neutral or slightly alkaline

In map units 3293 and 3325, the Smithcanyon soils are considered a taxadjunct to the series. These soils are cooler (in a mesic temperature regime) than the Smithcanyon series. This difference, however, does not affect the use and management of the soils.

## Snaggletooth Series

The Snaggletooth series consists of very deep, well drained soils that formed in alluvium from granite. Snaggletooth soils are on fan remnants. Slopes range from 1 to 4 percent. The mean annual precipitation is about 100 millimeters (about 4 inches), and the mean annual air temperature is about 24 degrees C (about 75 degrees F).

### Taxonomic Classification

Fine-loamy, mixed, superactive, hyperthermic Typic Calciargids

### Typical Pedon

Snaggletooth sandy loam; San Bernardino County, California; on a west-facing, smooth, 2 percent slope, about 28 miles due south of Needles, California, approximately 1 mile east and 10 miles south of Snaggletooth Hill located in Chemehuevi Valley; 20 feet north and 1,200 feet west of the southeast corner of section 12, T. 4 N., R. 22 E.; at an elevation of 346 meters (about 1,130 feet); lat. 34 degrees 26 minutes 34.2 seconds N. and long. 114 degrees 37 minutes 03.9 seconds W.; USGS Savahia Peak NE, California 7.5 minute topographic quadrangle; UTM 11S 0718869e 3813834n (DTM: NAD83). The surface is covered by approximately 65 percent gravel. (Colors are for dry soil unless otherwise noted.)

- A—0 to 4 centimeters (0 to 2 inches); light brown (7.5YR 6/3) sandy loam, brown (7.5YR 4/3) moist; strong very thick platy structure; moderately hard, very friable; nonsticky and nonplastic; common very fine roots; many very fine vesicular and tubular pores; 10 percent gravel; violently effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 5 centimeters thick)
- Bw—4 to 49 centimeters (2 to 19 inches); light brown (7.5YR 6/3) gravelly sandy loam, brown (7.5YR 4/3) moist; weak coarse subangular blocky structure; soft and slightly hard, very friable; nonsticky and nonplastic; many very fine and few fine and medium roots; many very fine tubular pores; 15 percent gravel; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 45 centimeters thick)
- Btk1—49 to 92 centimeters (19 to 36 inches); light brown (7.5YR 6/4) gravelly loam, brown (7.5YR 4/4) moist; moderate medium and coarse subangular blocky structure; moderately hard, very friable; slightly sticky and moderately plastic; common very fine roots; many very fine and common fine tubular pores; 15 percent faint brown (7.5YR 5/4) clay films on faces of peds and bridging sand grains; 10 percent 2- to 20-millimeter white (10YR 8/1) irregular calcium carbonate masses in matrix around concentrations, soft, clear; 15 percent gravel; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.
- Btk2—92 to 135 centimeters (36 to 53 inches); light brown (7.5YR 6/3) loam, brown (7.5YR 4/4) moist; moderate coarse subangular blocky structure; moderately hard, very friable; slightly sticky and moderately plastic; many very fine and common fine tubular pores; 15 percent faint brown (7.5YR 5/4) clay films on faces of peds and bridging sand grains; 15 percent 2- to 20-millimeter white (10YR 8/1) irregular



calcium carbonate masses in matrix around concentrations, moderately hard, clear; 3 percent gravel; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

**Btk3**—135 to 200 centimeters (53 to 79 inches); light brown (7.5YR 6/4) gravelly sandy loam, brown (7.5YR 5/4) moist; weak coarse subangular blocky structure; moderately hard, very friable; slightly sticky and moderately plastic; many very fine and few fine tubular and few very fine interstitial pores; 15 percent faint brown (7.5YR 5/4) clay films on faces of peds and bridging sand grains; 10 percent 2- to 20-millimeter white (10YR 8/1) irregular calcium carbonate masses in matrix around concentrations, soft, clear; 3 percent gravel; violently effervescent; strongly alkaline (pH 8.6). (Combined thickness of the Btk horizons is more than 100 centimeters)

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some part during summer or winter; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 26.7 degrees C (72 to 80 degrees F)

*Depth to argillic horizon:* 2 to 50 centimeters

*Depth to base of argillic horizon:* 150 to 200 centimeters

*Depth to calcic horizon:* 2 to 50 centimeters

*Organic matter content:* 0 to 0.5 percent

#### *Control section:*

Rock fragments—0 to 15 percent; mainly fine and medium gravel

Clay content—average of 18 to 30 percent

#### *A horizon:*

Hue—7.5YR or 10YR

Chroma—3 or 4

Structure—weak to strong and thick and very thick

Consistence—soft to moderately hard, nonsticky or slightly sticky, and nonplastic or slightly plastic

Rock fragments—0 to 15 percent

Calcium carbonate equivalent of the fine-earth fraction—5 to 15 percent

#### *Bw horizon:*

Value—4 or 5 moist

Chroma—3 or 4

Structure—moderate or coarse subangular blocky or massive

Rock fragments—0 to 50 percent

Calcium carbonate equivalent of the fine-earth fraction—5 to 15 percent

Other features—sandy loam is the typical texture but some pedons have very gravelly coarse sand; some pedons have 1 to 4 percent secondary calcium carbonate masses

Note—in some pedons the horizon has clay films but does not meet the requirements for an argillic horizon

#### *Btk horizon:*

Value—6 or 7 dry; 4 or 5 moist

Chroma—3, 4, or 6

Texture of the fine-earth fraction—loam, clay loam, or sandy loam

Structure—moderate or strong

Consistence—moderately hard or hard and very friable or friable; slightly sticky or moderately sticky and slightly plastic or moderately plastic

Rock fragments—average of 0 to 15 percent; ranging from 0 to 20 percent

Reaction—moderately alkaline or strongly alkaline



Calcium carbonate equivalent of the fine-earth fraction—10 to 25 percent

Other features—5 to 35 percent secondary calcium carbonate masses

## Stranger Series

The Stranger series consists of very shallow, somewhat excessively drained soils that formed in residuum from granitoid rock. Stranger soils are on pediments. Slopes range from 2 to 50 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Mixed, thermic Lithic Torripsamments

### Typical Pedon

Stranger sand; Riverside County, California; on a north-facing, linear, 2 percent slope under desert shrubs, approximately 0.45 kilometer east of Pinto Basin Road in Joshua Tree National Park; 453 meters (1,487 feet) east and 26 meters (85 feet) north of the southwest corner of section 6, T. 4 S., R. 12 E., San Bernardino Base and Meridian; at an elevation of 736 meters (2,414 feet); lat. 33 degrees 50 minutes 32.4 seconds N. and long. 115 degrees 46 minutes 05.5 seconds W.; USGS Porcupine Wash 7.5 minute topographic quadrangle; UTM 11S 613968e 3745357n (DTM: NAD83). The surface is covered by approximately 45 percent fine gravel and 20 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 2 centimeters (0 to 1 inch); pale brown (10YR 6/3) sand, brown (10YR 5/3) moist; weak thin platy structure; slightly hard, very friable; nonsticky and nonplastic; very few very fine roots; 9 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.4); clear wavy boundary. (1 to 3 centimeters thick)

C—2 to 22 centimeters (1 to 9 inches); very pale brown (10YR 7/4) sand, light yellowish brown (10YR 6/4) moist; massive; soft, very friable; nonsticky and nonplastic; few very fine roots; 5 percent fine gravel; slightly alkaline (pH 7.4); abrupt wavy boundary. (7 to 23 centimeters thick)

R—22 centimeters (9 inches); unfractured granitoid bedrock.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 65 to 80 percent; including 15 to 50 percent fine gravel, 10 to 30 percent medium and coarse gravel, 0 to 20 percent cobbles, 0 to 10 percent stones, and 0 to 5 percent boulders

*Control section:*

Clay content—1 to 5 percent

Organic matter content—0 to 0.5 percent

Rock fragments—5 to 35 percent; dominantly gravel

Depth to a lithic contact—8 to 25 centimeters (3 to 10 inches)

*A horizon:*

Value—5 or 6 dry; 4 or 5 moist

Chroma—3 to 6 dry; 3 or 4 moist

Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand

Clay content—1 to 8 percent

Rock fragments—10 to 30 percent; including 10 to 25 percent gravel and 0 to 5 percent cobbles

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral to slightly alkaline

*C horizon:*

Value—3 to 7 dry; 4 to 6 moist

Chroma—4 to 6 dry; 3 or 4 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—1 to 5 percent

Rock fragments—5 to 30 percent gravel

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

## Stubbespring Series

The Stubbespring series consists of very shallow and shallow, well drained soils that formed in colluvium and residuum from granitoid rocks. Stubbespring soils are on hills. Slopes range from 15 to 50 percent. The mean annual precipitation is about 200 millimeters (8 inches), and the mean annual air temperature is about 15 degrees C (59 degrees F).

### Taxonomic Classification

Loamy, mixed, superactive, thermic, shallow Xeric Haplargids

### Typical Pedon

Stubbespring coarse sand; Riverside County, California; on a north-facing (14 degrees), 45 percent slope, approximately 4.7 kilometers west of the intersection of Keys View Road and Juniper Flat Road and due south of Juniper Flat Road in Joshua Tree National Park; approximately 390 meters east and 120 meters north of the southwest corner of section 25, T. 2 S., R. 7 E., San Bernardino Base and Meridian; at an elevation of 1,460 meters (about 4,790 feet); lat. 33 degrees 57 minutes 45.8 seconds N. and long. 116 degrees 12 minutes 34.1 seconds W.; USGS Keys View, California 7.5 minute topographic quadrangle; UTM 11S 573037e 3758304n (DTM: NAD83). The surface is covered by 25 percent fine gravel, 30 percent medium and coarse gravel, 15 percent cobbles, 3 percent stones, and 2 percent boulders. (When described, the soil was dry throughout.)

A—0 to 3 centimeters (0 to 1 inch); light olive brown (2.5Y 5/3) coarse sand, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; few fine and common very fine roots; common fine interstitial pores; slightly alkaline (pH 7.5); clear wavy boundary.

Bw—3 to 10 centimeters (1 to 4 inches); light olive brown (2.5Y 5/3) sand, dark olive brown (2.5Y 3/3) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; common fine and many very fine roots; common fine interstitial pores; slightly alkaline (pH 7.4); clear wavy boundary. (6 to 20 centimeters thick)

Bt—10 to 32 centimeters (4 to 13 inches); yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak coarse subangular blocky structure; hard, firm; slightly sticky and slightly plastic; common very fine, fine, and medium roots; common fine irregular and common very fine interstitial pores; 10 percent faint reddish brown (2.5YR 4/4), dry, clay films on rock fragments and 30 percent prominent reddish brown (2.5YR 4/4), dry, clay films on all faces of peds; 15 percent fine gravel and 10 percent medium and coarse paragravel; slightly alkaline (pH 7.6); gradual wavy boundary. (10 to 22 centimeters thick)

Crt—32 to 150 centimeters (13 to 59 inches); moderately cemented and moderately weathered granitoid bedrock; fractures are more than 10 centimeters apart; common very fine and few coarse roots in cracks; 5 percent prominent reddish brown (2.5YR 4/4), dry, clay films on rock fragments; moderate excavation difficulty.

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry from May 1 to November 30; moist in some or all parts the rest of the year; the soils have an aridic soil moisture regime bordering on xeric

*Soil temperature:* 15 to 19 degrees C (59 to 66 degrees F)

*Surface rock fragments:* 30 to 75 percent; including 25 to 35 percent fine gravel, 5 to 30 percent medium and coarse gravel, 0 to 15 percent cobbles, 0 to 3 percent stones, and 0 to 2 percent boulders

*Control section:*

Rock fragments—5 to 30 percent gravel

Clay content—8 to 16 percent

Organic matter content—0 to 1 percent

Effervescence—noneffervescent

Depth to argillic horizon—9 to 25 centimeters (4 to 10 inches)

Depth to paralithic contact—19 to 35 centimeters (7 to 14 inches)

*A horizon:*

Hue—10YR or 2.5Y

Value—3 to 5 moist

Chroma—3 or 4 dry; 2 or 3 moist

Texture of the fine-earth fraction—coarse sand or sandy loam

Clay content—3 to 10 percent

Rock fragments—5 to 10 percent

*Bw horizon:*

Hue—10YR or 2.5Y

Value—3 or 4 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sand or sandy loam

Clay content—4 to 14 percent

Rock fragments—5 to 11 percent

*Bt horizon:*

Value—4 or 5 dry; 3 or 4 moist

Chroma—4 or 6, dry or moist

Texture of the fine-earth fraction—sandy loam or loam

Clay content—8 to 17 percent

Rock fragments—3 to 30 percent; including 3 to 20 percent indurated gravel and 0 to 10 percent paragravel

Reaction—neutral to slightly alkaline

## **Sunmill Series**

The Sunmill series consists of very deep, well drained soils that formed in alluvium from granitoid rocks. Sunmill soils are on fan remnants and fan aprons over fan remnants. Slopes range from 1 to 8 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 21.5 degrees C (71 degrees F).

### **Taxonomic Classification**

Coarse-loamy, mixed, superactive, hyperthermic Typic Calciargids

#### **Typical Pedon**

Sunmill loamy sand; San Bernardino County, California; on a southeast-facing, linear, 5 percent slope under desert shrubs, approximately 12.7 kilometers (8 miles) northwest of the town of Twentynine Palms and approximately 2.2 kilometers (1.3 miles) northwest of the junction of Giant Rock and Lear Roads; 440 meters (1,143 feet) south and 800 meters (2,624 feet) west of the northeast corner of section 32, T. 2 N., R. 8 E., San Bernardino Base and Meridian; at an elevation of 690 meters (2,263 feet); lat. 34 degrees 13 minutes 05.9 seconds N. and long. 116 degrees 10 minutes 04.3 seconds W.; USGS Sunfair, California 7.5 minute topographic quadrangle; UTM 11S 0576650e 3786676n (DTM: NAD83). The surface is covered by approximately 30 percent fine gravel and 20 percent medium and coarse gravel. (Colors are for dry soil unless otherwise noted.)

A—0 to 4 centimeters (0 to 1.5 inches); very pale brown (10YR 7/4) loamy sand, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; few very fine roots; few fine vesicular pores; 2 percent very pale brown (10YR 8/2) calcium carbonate coats on bottom of rock fragments; 7 percent fine gravel and 3 percent medium and coarse gravel; strongly effervescent; slightly alkaline (pH 7.7); clear smooth boundary. (2 to 6 centimeters thick)

Bk—4 to 26 centimeters (1.5 to 10 inches); very pale brown (10YR 7/4) loamy coarse sand, yellowish brown (10YR 5/6) moist; weak medium subangular blocky structure; loose; nonsticky and nonplastic; common very fine roots; few fine interstitial pores; 2 percent very pale brown (10YR 8/2) calcium carbonate coats on bottom of rock fragments; 5 percent fine gravel; strongly effervescent; slightly alkaline (pH 7.7); clear wavy boundary. (19 to 48 centimeters thick)

Btk1—26 to 44 centimeters (10 to 17 inches); brownish yellow (10YR 6/6) sandy loam, yellowish brown (10YR 5/6) moist; weak medium subangular blocky structure; slightly hard, very friable; slightly sticky and nonplastic; common very fine roots; few fine interstitial pores; 10 percent distinct strong brown (7.5YR 5/6) clay films on faces of peds; 2 percent very pale brown (10YR 8/2) calcium carbonate coats on bottom of rock fragments; 5 percent fine gravel; strongly effervescent (calcium carbonate equivalent of 1 percent); slightly alkaline (pH 7.7); clear wavy boundary.

Btk2—44 to 78 centimeters (17 to 31 inches); brownish yellow (10YR 6/6) sandy loam, yellowish brown (10YR 5/6) moist; weak medium subangular blocky structure; slightly hard, friable; slightly sticky and slightly plastic; common very fine roots; few fine interstitial pores; 50 percent medium and coarse prominent very pale brown (10YR 8/2) irregular soft calcium carbonate masses throughout the matrix; 5 percent distinct strong brown (7.5YR 5/6) clay films on faces of peds; 5 percent fine gravel; violently effervescent (calcium carbonate equivalent of 15 percent); moderately alkaline (pH 8.2); clear wavy boundary. (Combined thickness of the Btk horizons is 10 to 90 centimeters)

B<sup>'</sup>k1—78 to 91 centimeters (31 to 36 inches); very pale brown (10YR 7/3) loamy sand, light yellowish brown (10YR 6/4) moist; weak fine subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine roots; few fine interstitial pores; 75 percent coarse and very coarse distinct very pale brown (10YR 8/2) irregular soft carbonate masses throughout the matrix; 5 percent fine gravel; violently effervescent (calcium carbonate equivalent of 10 percent); moderately alkaline (pH 8.4); gradual wavy boundary.

B<sup>'</sup>k2—91 to 137 centimeters (36 to 54 inches); very pale brown (10YR 8/3) coarse sand, light yellowish brown (10YR 6/4) moist; single grain; loose; nonsticky and

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nonplastic; few fine interstitial pores; 75 percent coarse and very coarse distinct very pale brown (10YR 8/2) irregular soft carbonate masses throughout the matrix; 10 percent fine gravel; violently effervescent; strongly alkaline (pH 8.7); gradual wavy boundary.

C—137 to 152 centimeters (54 to 60 inches); very pale brown (10YR 7/4) coarse sand, yellowish brown (10YR 5/4) moist; single grain; loose; nonsticky and nonplastic; few fine interstitial pores; 5 percent fine gravel; strongly effervescent; strongly alkaline (pH 8.6).

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 25 to 75 percent; including 15 to 45 percent fine gravel, 10 to 35 percent medium and coarse gravel, and 0 to 20 percent cobbles

#### *Control section:*

Clay content—average of 10 to 18 percent

Rock fragments—2 to 20 percent; dominantly gravel

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of an argillic horizon—25 to 50 centimeters (10 to 19 inches)

Depth to the upper boundary of a calcic horizon—25 to 45 centimeters (10 to 18 inches)

#### *A horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry; 4 or 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy sand, loamy fine sand, or sandy loam

Clay content—2 to 12 percent

Rock fragments—3 to 30 percent; including 3 to 25 percent gravel and 0 to 5 percent cobbles

Effervescence—noneffervescent to violently effervescent

Reaction—neutral to moderately alkaline

Salinity—0 to 2 dS/m

#### *Bk, Bw, and/or C horizons (if they occur):*

Hue—7.5YR, 10YR, or 2.5Y

Value—5 to 7 dry; 4 or 5 moist

Chroma—3 or 4 dry; 3 to 6 moist

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, or loamy sand

Clay content—2 to 6 percent

Rock fragments—2 to 30 percent; including 2 to 30 percent gravel and 0 to 5 percent cobbles

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Salinity—0 to 2 dS/m

#### *(2)Bt and/or (2)Btk horizons (if they occur):*

Hue—7.5YR or 10YR

Value—5 to 7 dry; 4 to 6 moist

Chroma—3 to 6 dry; 4 to 6 moist



Texture of the fine-earth fraction—coarse sandy loam, sandy loam, or sandy clay loam

Clay content—ranging from 8 to 23 percent; average of 10 to 18 percent

Rock fragments—3 to 20 percent gravel

Calcium carbonate equivalent—1 to 20 percent

Reaction—slightly alkaline to very strongly alkaline

Salinity—0 to 4 dS/m

*B<sub>7</sub>k, 2Bk, and/or 2Ck horizons (if they occur):*

Hue—7.5YR or 10YR

Value—6 to 8 dry; 4 to 8 moist

Chroma—2 to 6 dry; 3 to 6 moist

Texture of the fine-earth fraction—coarse sand, sand, loamy coarse sand, loamy sand, or sandy loam

Clay content—4 to 15 percent

Rock fragments—3 to 10 percent gravel

Calcium carbonate equivalent—1 to 45 percent

Reaction—slightly alkaline to strongly alkaline

Salinity—0 to 4 dS/m

## Supplymine Series

The Supplymine series consists of moderately deep, well drained soils that formed in residuum and colluvium from gneissic and granitoid rock. Supplymine soils are on mountains. Slopes range from 30 to 60 percent. The mean annual precipitation is 100 millimeters (4 inches), and the mean annual air temperature is 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocalcids

### Typical Pedon

Supplymine cobbles; San Bernardino County, California; on a south-southwest-facing, convex, 32 percent slope under desert shrubs, approximately 8 kilometers east of the junction of Highway 62 and Iron Age Road on Highway 62 and  $\frac{1}{3}$  mile south of Highway 62; about 125 meters (405 feet) east and 470 meters (1,523 feet) south of the northwest corner of section 14, T. 1 S., R. 13 E., San Bernardino Base and Meridian; at an elevation of 584 meters (1,892 feet); lat. 34 degrees 05 minutes 19.8 seconds N. and long. 115 degrees 35 minutes 42.5 seconds W.; USGS Clarks Pass 7.5 minute topographic quadrangle; UTM 11S 0629604e 3772896n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 14 centimeters (0 to 5.5 inches); cobbles; approximately 20 percent fine gravel, 20 percent medium and coarse gravel, 35 percent cobbles, and 15 percent stones; abrupt wavy boundary. (7 to 25 centimeters thick)

A—14 to 19 centimeters (5.5 to 7 inches); yellowish brown (10YR 5/4) very cobbly loamy fine sand, olive brown (2.5Y 4/3) moist; weak thick platy structure parting to weak fine subangular blocky; slightly hard, friable; nonsticky and nonplastic; few very fine roots; few medium tubular pores; 5 percent fine gravel, 10 percent medium and coarse gravel, 15 percent cobbles, and 5 percent stones; very slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 6 centimeters thick)

Bk1—19 to 51 centimeters (7 to 20 inches); yellowish brown (10YR 5/4) very cobbly fine sandy loam, olive brown (2.5Y 4/3) moist; weak fine subangular blocky structure; slightly hard, friable; nonsticky and slightly plastic; few very fine and

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fine and very few medium and coarse roots; 5 percent prominent very pale brown (10YR 8/2) calcium carbonate coats on bottom of rock fragments; 10 percent fine gravel, 15 percent medium and coarse gravel, 15 percent cobbles, and 10 percent stones; strongly effervescent (5 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); gradual wavy boundary.

**Bk2**—51 to 84 centimeters (20 to 33 inches); light brownish gray (2.5Y 6/2) very gravelly fine sandy loam, olive (5Y 5/3) moist; weak fine subangular blocky structure parting to massive; slightly hard, friable; slightly sticky and slightly plastic; very few fine and medium roots; 15 percent prominent very pale brown (10YR 8/2) calcium carbonate coats on bottom of rock fragments; 25 percent coarse prominent white (10YR 8/1) irregular calcium carbonate masses within the matrix; 10 percent fine gravel, 15 percent medium and coarse gravel, 10 percent cobbles, 5 percent stones, 10 percent paragravel, and 15 percent paracobbles; violently effervescent (19 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); abrupt irregular boundary. (Combined thickness of the Bk horizons is 45 to 70 centimeters)

**Rk**—84 to 91 centimeters (33 to 36 inches); gneissic bedrock that is fractured in the upper part; 15 percent prominent very pale brown (10YR 8/2) calcium carbonate coats on rock fragments and in fractures.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 77 degrees F)

*Surface rock fragments:* 80 to 95 percent; including 15 to 25 percent fine gravel, 10 to 20 percent medium and coarse gravel, 25 to 40 percent cobbles, and 15 to 40 percent stones

#### *Control section:*

Rock fragments—average of 35 to 75 percent; gravel, cobbles, and stones

Clay content—average of 6 to 12 percent

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of a calcic horizon—35 to 60 centimeters (14 to 24 inches)

Depth to a lithic contact—50 to 100 centimeters (20 to 40 inches)

#### *C horizon:*

In lieu of texture—gravel or cobbles

Rock fragments—80 to 95 percent; including 25 to 80 percent gravel, 10 to 40 percent cobbles, and 5 to 40 percent stones and boulders

#### *A horizon:*

Hue—10YR or 2.5Y

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy fine sand or fine sandy loam

Clay content—2 to 8 percent

Rock fragments—35 to 60 percent; including 15 to 45 percent gravel, 0 to 20 percent cobbles, and 0 to 5 percent stones

Effervescence—noneffervescent or very slightly effervescent

Calcium carbonate equivalent—0 to 5 percent

Reaction—neutral to moderately alkaline

#### *Bk horizon:*

Hue—10YR, 2.5Y, or 5Y

Value—5 to 7 dry; 4 to 6 moist  
Chroma—2 to 4 moist; 3 or 4 dry  
Texture of the fine-earth fraction—sandy loam or fine sandy loam  
Clay content—6 to 12 percent  
Rock fragments—30 to 70 percent; including 20 to 55 percent gravel, 5 to 20 percent cobbles, 0 to 10 percent stones, 0 to 30 percent paragravel, and 0 to 15 percent paracobbles  
Effervescence—strongly or violently effervescent  
Calcium carbonate equivalent—5 to 40 percent  
Reaction—slightly alkaline to strongly alkaline

## Thunderclap Series

The Thunderclap series consists of very deep, somewhat excessively drained soils that formed in alluvium over residuum weathered from granitoid and gneissic rock. Thunderclap soils are on fan aprons over pediments. Slopes range from 4 to 8 percent. The mean annual precipitation is 200 millimeters (8 inches), and the mean annual air temperature is 15 degrees C (59 degrees F).

### Taxonomic Classification

Mixed, thermic Xeric Torripsamments

### Typical Pedon

Thunderclap sand; San Bernardino County, California; on an east-facing, 8 percent slope, approximately 14.5 kilometers (9 miles) southwest of the town of Yucca Valley; approximately 730 meters (2,400 feet) west and 355 meters (1,165 feet) south of the northeast corner of section 2, T. 2 S., R. 6 E., San Bernardino Base and Meridian; at an elevation of 1,564 meters; lat. 34 degrees 01 minute 46 seconds N. and long. 116 degrees 19 minutes 34 seconds W.; USGS Joshua Tree South 7.5 minute topographic quadrangle; UTM 11S 562203e 3765618n (DTM: NAD83). The surface is covered by approximately 10 percent fine gravel. (Colors are for dry soil unless otherwise stated.)

- A1—0 to 6 centimeters (0 to 2 inches); brown (10YR 5/3) sand, brown (10YR 4/3) moist; moderate coarse subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; common very fine roots; 2 percent fine gravel; slightly alkaline (pH 7.7); clear smooth boundary.
- A2—6 to 28 centimeters (2 to 11 inches); brown (10YR 5/3) sand, brown (10YR 4/3) moist; moderate coarse subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; common very fine roots; few very fine tubular pores; 2 percent fine gravel; moderately alkaline (pH 8.0); clear smooth boundary. (Combined thickness of the A horizons is 23 to 30 centimeters)
- C1—28 to 100 centimeters (11 to 37 inches); yellowish brown (10YR 5/4) sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable; nonsticky and nonplastic; common very fine roots; 2 percent fine gravel; moderately alkaline (pH 8.0); gradual smooth boundary.
- C2—100 to 160 centimeters (37 to 63 inches); yellowish brown (10YR 5/4) sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable; nonsticky and nonplastic; moderately few very fine roots; 2 percent fine gravel; slightly alkaline (pH 7.6); abrupt wavy boundary. (Combined thickness of the C horizons is more than 100 centimeters)
- Cr—160 to 200 centimeters (63 to 80 inches); soft granitoid bedrock that has cracks more than 10 centimeters apart; high excavation difficulty.

### Range in Characteristics

*Soil moisture control section:* Usually dry from May 1 to November 30; moist in some or all parts the rest of the year; the soils have an aridic soil moisture regime bordering on xeric

*Soil temperature:* 15 to 19 degrees C (59 to 66 degrees F)

*Surface rock fragments:* 10 to 34 percent; dominantly fine gravel

*Control section:*

Rock fragments—2 to 5 percent; dominantly fine gravel

Organic matter content—0 to 1 percent

Clay content—1 to 4 percent

Effervescence—noneffervescent throughout

Depth to paralithic contact—150 to 200 centimeters (60 to 80 inches)

*A horizon:*

Value—4 or 5 dry; 3 or 4 moist

Chroma—3 or 4 dry; 2 or 3 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—2 to 4 percent

Rock fragments—2 to 5 percent; dominantly fine gravel

Reaction—neutral to moderately alkaline

*C horizon:*

Chroma—3 or 4 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—1 to 4 percent

Rock fragments—2 to 17 percent (2 to 5 percent in the upper part of horizon and 2 to 17 percent in the lower part); dominantly fine gravel

Reaction—neutral to moderately alkaline

## Typic Argidurids

Typic Argidurids consist of moderately deep, well drained soils that formed in alluvium from granitoid and/or gneissic rocks. These soils are on fan remnants. Slopes range from 8 to 30 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Typic Argidurids

#### Typical Pedon

Typic Argidurids-Coppermine-Minhoyt complex, 4 to 30 percent slopes; Riverside County, California; about 370 meters (1,214 feet) west and 785 meters (2,575 feet) south of the northeast corner of section 25, T. 2 S., R. 9 E., San Bernardino Base and Meridian; at an elevation of 1,011 meters (3,316 feet); lat. 33 degrees 58 minutes 06.0 seconds N. and long. 115 degrees 59 minutes 15.7 seconds W.; USGS Fried Liver Wash, California 7.5 minute topographic quadrangle; UTM 11S 0593520e 3759106n (DTM: NAD83). (Colors are for dry soil unless otherwise noted.)

C—0 to 3 centimeters (0 to 1 inch); gravel; approximately 25 percent fine gravel, 60 percent medium and coarse gravel, 4 percent cobbles, and 1 percent stones; abrupt wavy boundary.

A—3 to 6 centimeters (1 to 2 inches); yellowish brown (10YR 5/4) fine sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable; nonsticky and slightly plastic; few very fine roots; very few

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- fine vesicular and few fine interstitial pores; 3 percent fine gravel and 2 percent medium and coarse gravel; moderately alkaline (pH 8.0); clear wavy boundary.
- Btq1—6 to 19 centimeters (2 to 7.5 inches); dark yellowish brown (10YR 4/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable; slightly sticky and moderately plastic; common very fine roots; 5 percent faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 3 percent distinct very pale brown (10YR 7/4) silica films on rock fragments; 15 percent fine gravel, 15 percent medium and coarse gravel, and 1 percent cobbles; slightly effervescent; moderately alkaline (pH 8.1); gradual wavy boundary.
- Btq2—19 to 45 centimeters (7.5 to 17.5 inches); dark yellowish brown (10YR 4/6) very gravelly clay loam, dark yellowish brown (10YR 4/6) moist; weak moderate subangular blocky structure; hard, firm; slightly sticky and moderately plastic; common very fine, few fine, and very few medium roots; 5 percent faint dark yellowish brown (10YR 4/6) clay films on faces of peds; 3 percent distinct very pale brown (10YR 7/4) silica films on rock fragments; 20 percent fine gravel, 25 percent medium and coarse gravel, and 1 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
- Btkq—45 to 59 centimeters (17.5 to 19.5 inches); pale brown (10YR 6/3) very gravelly loam, light yellowish brown (10YR 6/4) moist; weak medium subangular blocky structure; moderately hard, firm; slightly sticky and moderately plastic; very few medium roots; 10 percent white (10YR 8/1) medium irregular calcium carbonate masses in the matrix; 5 percent prominent white (10YR 8/1) calcium carbonate coats on rock fragments; 1 percent faint light yellowish brown (10YR 6/4) clay films on faces of peds; 8 percent distinct very pale brown (10YR 6/4) silica films on rock fragments; 20 percent fine gravel, 30 percent medium and coarse gravel, and 1 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); very abrupt smooth boundary.
- Bkqm—59 to 84 centimeters (19.5 to 33.5 inches); very pale brown (10YR 8/2), indurated, continuously cemented duripan that has a 3- to 5-millimeter-thick laminar cap, very pale brown (10YR 8/2) moist.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

#### *Control section:*

- Rock fragments—average of 35 to 50 percent
- Clay content—20 to 28 percent
- Organic matter content—0 to 0.5 percent
- Effervescence—slightly to violently effervescent

#### *C horizon:*

- Rock fragments—80 to 90 percent; including 25 to 30 percent fine gravel, 55 to 65 percent medium to coarse gravel, 0 to 5 percent cobbles, and 0 to 1 percent stones

#### *A horizon:*

- Rock fragments—2 to 10 percent gravel

#### *Btq and Btkq horizons:*

- Value—4 to 6, dry or moist
- Chroma—3 to 6 dry; 4 to 6 moist



Texture of the fine-earth fraction—loam or clay loam

Clay content—18 to 30 percent

Rock fragments—30 to 55 percent; including 30 to 55 percent gravel and 0 to 2 percent cobbles

## Werewolf Series

The Werewolf series consists of very deep, well drained soils that formed in mixed alluvium. Werewolf soils are on fan remnants. Slopes range from 2 to 15 percent. The mean annual precipitation is about 125 millimeters (5 inches), and the mean annual air temperature is about 18 degrees C (64 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, thermic Typic Haplargids

### Typical Pedon

Werewolf-Arizo association, 2 to 8 percent slopes; San Bernardino County, California; about 4.6 kilometers (2.8 miles) west and 0.5 kilometer (0.3 mile) north of the southwest corner of section 7, T. 16 N., R. 6 E., in a nonsectioned area, San Bernardino Base and Meridian; at an elevation of 1,135 meters (3,722 feet); lat. 35 degrees 29 minutes 33 seconds N. and long. 116 degrees 26 minutes 23 seconds W.; USGS Red Pass Lake NW 7.5 minute topographic quadrangle; UTM 11S 0550827e 3927805n (DTM: NAD83). The surface is covered by approximately 65 percent gravel, 4 percent cobbles, and 1 percent stones. (Colors are for dry soil unless otherwise noted.)

- A—0 to 8 centimeters (0 to 3 inches); light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable; nonsticky and nonplastic; common very fine roots; common very fine and few fine interstitial and tubular pores; 65 percent gravel, 4 percent cobbles, and 1 percent stones; slightly alkaline (pH 7.6); clear smooth boundary. (2 to 8 centimeters thick)
- Bw—8 to 33 centimeters (3 to 13 inches); light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; moderately hard, very friable; slightly sticky and slightly plastic; common very fine and few fine roots; common very fine interstitial and few very fine to medium tubular pores; 45 percent gravel and 2 percent cobbles; slightly alkaline (pH 7.6); clear wavy boundary. (23 to 38 centimeters thick)
- Bt—33 to 76 centimeters (13 to 30 inches); brown (7.5YR 5/4) extremely gravelly coarse sandy loam, brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; moderately hard, very friable; slightly sticky and slightly plastic; few very fine roots; common very fine and few fine interstitial and tubular pores; 30 percent faint clay films on faces of peds and coating sand and gravel; 65 percent gravel and 2 percent cobbles; slightly alkaline (pH 7.8); clear wavy boundary. (41 to 104 centimeters thick)
- Btk—76 to 152 centimeters (30 to 60 inches); brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, very friable; slightly sticky and plastic; few very fine roots; common very fine tubular pores; 1 percent soft carbonate threads; 50 percent distinct clay films on sand and gravel; 90 percent prominent clay films on faces of peds; 35 percent gravel and 3 percent cobbles; moderately alkaline (pH 8.0).

**Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 17 to 22 degrees C (63 to 72 degrees F)

*Surface rock fragments:* 25 to 85 percent; including 15 to 45 percent fine gravel, 10 to 45 percent medium and coarse gravel, 0 to 15 percent cobbles, and 0 to 3 percent stones

*Control section:*

Rock fragments—average of 35 to 85 percent; gravel, cobbles, and stones

Clay content—average of 12 to 18 percent

Organic matter content—0 to 0.5 percent

Depth to the upper boundary of an argillic horizon—25 to 50 centimeters (10 to 20 inches)

*A horizon:*

Value—4 to 6 dry; 3 or 4 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy sand, sandy loam, or loam

Clay content—3 to 14 percent

Rock fragments—2 to 85 percent; including 2 to 80 percent gravel, 0 to 15 percent cobbles, and 0 to 3 percent stones

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

*Bw, Bk, and/or Bkq horizons (if they occur):*

Value—5 or 6 dry; 3 to 5 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—loamy sand, sandy loam, fine sandy loam, or loam

Clay content—3 to 15 percent

Rock fragments—5 to 50 percent; including 5 to 45 percent gravel, 0 to 10 percent cobbles, and 0 to 1 percent stones

Effervescence—noneffervescent to violently effervescent

Calcium carbonate equivalent—0 to 1 percent

Reaction—slightly alkaline or moderately alkaline

Visible secondary carbonates—0 to 15 percent as coats on bottom of rock fragments

Silica—0 to 10 percent as coats

*Bt, Btk, and/or Btkq horizons (if they occur):*

Hue—7.5YR or 10YR

Value—4 or 5 dry; 3 to 5 moist

Chroma—4 to 6, dry or moist

Texture of the fine-earth fraction—loamy coarse sand, coarse sandy loam, sandy loam, or loam

Clay content—8 to 18 percent

Rock fragments—25 to 80 percent; including 25 to 70 percent gravel, 0 to 25 percent cobbles, and 0 to 1 percent stones

Effervescence—noneffervescent to strongly effervescent

Calcium carbonate equivalent—0 to 1 percent

Reaction—slightly alkaline or moderately alkaline

Visible secondary carbonates—0 to 15 percent as coats on rock fragments or 0 to 1 percent as threads in the matrix  
Silica—0 to 10 percent as coats

## Whipple Series

The Whipple series consists of very shallow and shallow, somewhat excessively drained soils that formed in residuum and colluvium from granite. Whipple soils are on backslopes of hills. Slopes range from 8 to 50 percent. The mean annual precipitation is about 100 millimeters (4 inches), and the mean annual air temperature is about 24 degrees C (75 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplargids

### Typical Pedon

Whipple gravelly fine sandy loam; San Bernardino County, California; on a northwest-facing, smooth, 9 percent slope, about 34 miles south of Needles, approximately 1.5 miles east and 3.3 miles north of Pyramid Butte, located on the south side of Chemehuevi Valley; 1,400 feet north and 150 feet west of the southeast corner of tentative section 7, T. 3 N., R. 23 E.; at an elevation of 396 meters (about 1,300 feet); lat. 34 degrees 21 minutes 30.5 seconds N. and long. 114 degrees 35 minutes 48.7 seconds W.; USGS Savahia Peak, California 7.5 minute topographic quadrangle; UTM 11S 0721011e 3804517n (DTM: NAD83). The surface is covered by approximately 85 percent gravel and 8 percent cobbles. (Colors are for dry soil unless otherwise noted.)

A—0 to 3 centimeters (0 to 1 inch); light yellowish brown (10YR 6/4) very gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure; soft, very friable; nonsticky and nonplastic; few very fine roots; few very fine interstitial and few fine tubular pores; 40 percent gravel; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 4 centimeters thick)

Btk—3 to 24 centimeters (1 to 9 inches); strong brown (7.5YR 5/6) extremely gravelly loam, strong brown (7.5YR 4/6) moist; massive; soft, very friable; nonsticky and nonplastic; many very fine, common fine, and few medium roots; common very fine interstitial pores; 20 percent distinct brown (7.5YR 5/4) clay films on faces of peds, 5 percent faint brown (7.5YR 5/4) clay films between sand grains, and 15 percent distinct brown (7.5YR 5/4) clay films on rock fragments; 5 percent medium to coarse distinct irregular very pale brown (10YR 8/2) calcium carbonate masses in matrix with clear boundaries and 15 percent distinct very pale brown (10YR 8/2) carbonate coats on bottom of rock fragments; 70 percent gravel and 1 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (8 to 32 centimeters thick)

R—24 to 49 centimeters (9 to 20 inches); granitic bedrock.

### Range in Characteristics

*Soil moisture control section:* Usually dry throughout the profile; rarely moist in some part during summer or winter; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 26.7 degrees C (72 to 80 degrees)

*Depth to argillic horizon:* 2 to 4 centimeters

*Depth to bedrock:* 13 to 36 centimeters

*Organic matter content:* 0 to 0.5 percent

*Control section:*

Clay content—average of 12 to 18 percent

*A horizon:*

Value—3 or 4 moist  
Chroma—3 or 4  
Clay content—8 to 12 percent  
Structure—weak or fine, thin or medium, and platy or subangular blocky  
Consistence—soft or slightly hard and nonsticky or slightly sticky  
Rock fragments—35 to 60 percent; including 0 to 5 percent cobbles or stones  
Effervescence—slightly to strongly effervescent  
Calcium carbonate equivalent of the fine-earth fraction—0 to 5 percent

*Btk horizon or Btkq horizon (if it occurs):*

Hue—10YR or 7.5YR  
Chroma—4 or 6  
Clay content—12 to 20 percent  
Texture of the fine-earth fraction—loam or sandy loam  
Structure—massive or subangular blocky  
Consistence—soft to moderately hard, nonsticky or slightly sticky, and nonplastic or slightly plastic  
Rock fragments—60 to 85 percent gravel and 0 to 5 percent cobbles or stones  
Effervescence—strongly or violently effervescent  
Calcium carbonate equivalent of the fine-earth fraction—0 to 5 percent

In map unit 1225, the Whipple soils are considered a taxadjunct to the series. These soils are cooler (thermic temperature regime) than the series. This difference, however, does not affect the use and management of the soils.

## Whiterobe Series

The Whiterobe series consists of moderately deep, somewhat excessively drained soils that formed in colluvium and residuum weathered from granitoid and/or gneissic rock. Whiterobe soils are on mountains. Slopes range from 30 to 75 percent. The average annual precipitation is 100 millimeters (4 inches), and the average annual air temperature is 21.5 degrees C (71 degrees F).

### Taxonomic Classification

Sandy, mixed, hyperthermic Typic Torriorthents

### Typical Pedon

Whiterobe gravel; Riverside County, California; on a southwest-facing, 51 percent slope, approximately 21 kilometers (13 miles) north of the city of Indio, in Joshua Tree National Park; approximately 145 meters (475 feet) west and 725 meters (2,380 feet) south of the northeast corner of section 20, T. 3 S., R. 7 E., San Bernardino Base and Meridian; at an elevation of 590 meters (1,935 feet); lat. 33 degrees 53 minutes 50 seconds N. and long. 116 degrees 16 minutes 03 seconds W.; USGS East Deception Canyon 7.5 minute topographic quadrangle; UTM 11S 567718e 3751015n (DTM: NAD83). (Colors are for dry soil unless otherwise stated.)

C—0 to 3 centimeters (0 to 1 inch); gravel; 10 percent fine gravel, 48 percent medium and coarse gravel, 20 percent cobbles, and 2 percent stones; abrupt smooth boundary. (0 to 5 centimeters thick)

A—3 to 5 centimeters (1 to 2 inches); pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine roots; few very fine and fine irregular pores; 15 percent fine gravel, 40 percent medium and coarse gravel, and

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5 percent cobbles; very slightly effervescent; moderately alkaline (pH 8.3); clear smooth boundary. (2 to 6 centimeters thick)

**Bk1**—5 to 30 centimeters (2 to 12 inches); light yellowish brown (10YR 6/4) very gravelly loamy sand, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine, common fine, and few medium roots; few very fine irregular pores; 50 percent prominent very pale brown (10YR 8/2), moist, calcium carbonate coats on top of rock fragments; 15 percent fine gravel, 25 percent medium and coarse gravel, 5 percent medium and coarse paragravel, and 2 percent cobbles; slightly effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

**Bk2**—30 to 65 centimeters (12 to 26 inches); light brownish gray (10YR 6/2) paragravelly sand, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine and few medium roots; few very fine irregular pores; 30 percent prominent very pale brown (10YR 8/2), moist, calcium carbonate coats on top of rock fragments; 5 percent fine gravel, 5 percent medium and coarse gravel, and 10 percent medium and coarse paragravel; violently effervescent; strongly alkaline (pH 8.6); abrupt irregular boundary. (Combined thickness of the Bk horizons is 39 to 77 centimeters)

**Crk**—65 to 150 centimeters (26 to 60 inches); moderately cemented, soft granitoid bedrock; cracks more than 10 centimeters apart; high excavation difficulty; few fine roots in mats at top of horizon; 80 percent prominent very pale brown (10YR 8/2), moist, calcium carbonate coats on rock fragments; slightly effervescent.

### Range in Characteristics

*Soil moisture control section:* Usually dry; moist in some parts for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 22 to 25 degrees C (72 to 79 degrees F)

*Surface rock fragments:* 80 to 90 percent; dominantly gravel

#### *Control section:*

Rock fragments—ranging from 5 to 55 percent; average of 10 to 30 percent; dominantly gravel

Organic matter content—0 to 0.5 percent

Clay content—1 to 6 percent

Depth to paralithic contact—50 to 100 centimeters (20 to 40 inches)

#### *C horizon (if it occurs):*

Rock fragments—80 to 90 percent; including 40 to 80 percent gravel, 5 to 20 percent cobbles, and 0 to 6 percent stones and boulders

#### *A horizon:*

Value—5 or 6 dry; 3 to 5 moist

Chroma—3 or 4 dry; 2 or 3 moist

Clay content—1 to 4 percent

Rock fragments—35 to 75 percent; dominantly gravel

Effervescence—noneffervescent or very slightly effervescent

Reaction—neutral to moderately alkaline

#### *Bk1 horizon or Bw horizon (if it occurs):*

Value—3 to 6 dry; 3 to 5 moist

Chroma—3 to 6 dry; 2 to 4 moist

Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand

Clay content—1 to 6 percent



Rock fragments—15 to 70 percent; including 15 to 55 percent indurated gravel, 0 to 2 percent cobbles, and 0 to 15 percent paragravel  
Effervescence—noneffervescent to strongly effervescent  
Reaction—slightly alkaline to strongly alkaline

*Bk2 horizon:*

Value—3 to 6 dry; 3 to 5 moist  
Chroma—3 to 6 dry; 2 to 4 moist  
Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand  
Clay content—1 to 6 percent  
Rock fragments—5 to 45 percent; including 5 to 35 percent indurated gravel and 0 to 10 percent paragravel  
Effervescence—noneffervescent to strongly effervescent  
Reaction—slightly alkaline to strongly alkaline

*C, C', or Ck horizon (if it occurs):*

Value—5 to 7 dry; 2 to 6 moist  
Chroma—2 or 3 dry; 2 to 4 moist  
Texture of the fine-earth fraction—sand, loamy sand, or loamy fine sand  
Clay content—1 to 4 percent  
Rock fragments—5 to 90 percent; including 3 to 32 percent indurated gravel and 2 to 58 percent paragravel  
Effervescence—noneffervescent to violently effervescent  
Reaction—moderately alkaline or strongly alkaline

## **Xeric Torriorthents**

Xeric Torriorthents consist of moderately deep to deep, somewhat excessively drained soils that formed in colluvium over residuum weathered from granitoid. These soils are on hills and mountains. Slopes range from 30 to 75 percent. The mean annual precipitation is 200 millimeters, and the mean annual air temperature is 15 degrees C. The frost-free season is 210 to 270 days.

### **Taxonomic Classification**

Xeric Torriorthents

#### **Typical Pedon**

Xeric Torriorthents-Bigbernie association, 30 to 75 percent slopes; San Bernardino County, California; approximately 4.5 miles east of the town of Morongo Valley; 355 meters east and 187 meters north of the southwest corner of section 28, T. 1 S., R. 5 E., San Bernardino Base and Meridian; at an elevation of 1,089 meters; lat. 34 degrees 02 minutes 56 seconds N. and long. 116 degrees 28 minutes 15 seconds W.; USGS Yucca Valley South, California 7.5 minute topographic quadrangle; UTM 11S 548833e 3767707n (DTM: NAD83). The surface is covered by 5 percent fine gravel, 15 percent medium and coarse gravel, and 2 percent cobbles. (Colors are for dry soil unless otherwise stated.)

- A—0 to 22 centimeters (0 to 9 inches); brown (10YR 5/3) gravelly loamy sand, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine roots; few very fine dendritic tubular pores; 8 percent fine gravel and 7 percent medium and coarse gravel; neutral (pH 7.1); gradual wavy boundary.
- C1—22 to 66 centimeters (9 to 26 inches); yellowish brown (10YR 5/4) very gravelly loamy sand, brown (10YR 4/3) moist; single grain; loose; nonsticky and nonplastic; common very fine, very few fine, moderately few medium, and common very coarse roots; few very fine dendritic tubular pores; 20 percent fine gravel and

25 percent medium and coarse gravel; slightly alkaline (pH 7.4); gradual wavy boundary.

C2—66 to 92 centimeters (26 to 36 inches); yellowish brown (10YR 5/4) extremely gravelly loamy sand, brown (10YR 4/3) moist; single grain; loose; nonsticky and nonplastic; common medium, very few fine, and moderately few very fine roots; 20 percent fine gravel, 45 percent medium and coarse gravel, and 2 percent cobbles; slightly alkaline (pH 7.5); gradual wavy boundary.

C3—92 to 126 centimeters (36 to 50 inches); yellowish brown (10YR 5/4) gravelly sand, dark brown (10YR 3/3) moist; single grain; loose; nonsticky and nonplastic; moderately few medium, very few fine, and common very fine roots; 20 percent fine gravel and 10 percent medium and coarse gravel; slightly alkaline (pH 7.6); abrupt wavy boundary.

Cr—126 to 150 centimeters (50 to 60 inches); fractured granitoid bedrock; cracks more than 10 centimeters apart.

### Range in Characteristics

*Soil moisture control section:* Usually dry from May 1 to November 30; moist in some or all parts the rest of the year; the soils have an aridic soil moisture regime bordering on xeric

*Soil temperature:* 15 to 19 degrees C (59 to 66 degrees F)

*Surface rock fragments:* 20 to 52 percent; including 5 to 43 percent gravel, 2 to 15 percent cobbles, and 0 to 5 percent stones

#### *Control section:*

Clay content—1 to 12 percent

Organic matter content—0.25 to 1 percent

Rock fragments—30 to 80 percent

Depth to paralithic contact—50 to 150 centimeters (20 to 60 inches)

#### *A horizon:*

Hue—10YR or 7.5YR

Value—4 or 5 dry; 3 or 4 moist

Chroma—3 or 4 dry; 2 or 6 moist

Texture of fine-earth fraction—sand, loamy sand, coarse sandy loam, or sandy loam

Clay content—1 to 17 percent

Rock fragments—15 to 34 percent; dominantly gravel

Reaction—neutral to moderately alkaline

#### *C horizon or Bw horizon (if it occurs):*

Hue—10YR or 7.5YR

Value—5 to 7 dry; 3 to 5 moist

Chroma—3 or 4, dry or 4 moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—1 to 12 percent

Rock fragments—30 to 85 percent; including 5 to 65 percent gravel, 0 to 60 percent cobbles, and 0 to 5 percent stones

Reaction—neutral to moderately alkaline

## Yander Series

The Yander series consists of deep, somewhat excessively drained soils that formed in alluvium derived from granite and gneiss over residuum weathered from granite. Yander soils are on fan aprons over pediments. Slopes range from 4 to 15 percent. The mean annual precipitation is 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### **Taxonomic Classification**

Mixed, thermic Typic Torripsamments

#### **Typical Pedon**

Yander loamy sand; Riverside County, California; on a 4 percent slope, approximately 0.125 mile southeast of the intersection of Split Rock Picnic Area Road and Park Boulevard in Joshua Tree National Park; approximately 257 meters south and 451 meters east of the northwest corner of section 16, T. 2 S., R. 9 E., San Bernardino Base and Meridian; at an elevation of 1,275 meters (4,182 feet); lat. 34 degrees 00 minutes 07.4 seconds N. and long. 116 degrees 02 minutes 56.1 seconds W.; USGS Queen Mountain, California 7.5 minute topographic quadrangle; UTM 11S 587830e 3762793n (DTM: NAD83). The surface is covered by 55 percent fine gravel, 14 percent medium and coarse gravel, and 1 percent cobbles. (When described, the soil was moist to a depth of 135 centimeters.)

- A—0 to 5 centimeters (0 to 2 inches); yellowish brown (10YR 5/4) loamy sand, dark brown (10YR 3/3) moist; moderate thick platy structure parting to moderate medium subangular blocky; slightly hard, very friable; nonsticky and nonplastic; common very fine roots; 4 percent fine gravel and 1 percent medium and coarse gravel; slightly alkaline (pH 7.6); clear wavy boundary. (3 to 8 centimeters thick)
- Bw—5 to 58 centimeters (2 to 23 inches); light yellowish brown (10YR 6/4) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive parting to weak medium subangular blocky structure; soft, very friable; nonsticky and nonplastic; common very fine roots; 19 percent fine gravel, 3 percent medium and coarse gravel, and 1 percent cobbles; moderately alkaline (pH 8.0); gradual smooth boundary. (0 to 53 centimeters thick)
- C—58 to 102 centimeters (23 to 40 inches); light yellowish brown (10YR 6/4) gravelly coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; loose; nonsticky and nonplastic; few very fine roots; 13 percent fine gravel, 4 percent medium and coarse gravel, and 1 percent cobbles; slightly alkaline (pH 7.6); abrupt wavy boundary. (44 to 110 centimeters thick)
- Cr—102 to 150 centimeters (40 to 60 inches); moderately weathered, granitoid bedrock that has fractures more than 10 centimeters apart.

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following summer convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

#### *Control section:*

Rock fragments—5 to 23 percent; dominantly fine gravel

Effervescence—noneffervescent throughout

Depth to paralithic contact—100 to 150 centimeters (40 to 60 inches)

#### *A horizon:*

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4, dry or moist

Texture of the fine-earth fraction—sand or loamy sand

Clay content—2 to 4 percent

Rock fragments—5 to 10 percent

Reaction—slightly acid to slightly alkaline

#### *Bw horizon (if it occurs):*

Value—5 or 6 dry

Texture of the fine-earth fraction—sand or loamy sand  
Clay content—4 or 5 percent  
Rock fragments—5 to 23 percent  
Reaction—moderately acid to moderately alkaline

*C horizon:*

Value—4 or 5 moist  
Chroma—4 or 5 dry; 3 or 5 moist  
Texture of the fine-earth fraction—coarse sand, sand, or loamy sand  
Clay content—2 to 7 percent  
Rock fragments—5 to 20 percent  
Reaction—moderately acid to slightly alkaline

*Cr horizon:*

Cementation—weak to moderate

## Yuccabutte Series

The Yuccabutte series consists of very deep, well drained soils that formed in alluvium from granitoid and/or gneissic rocks. Yuccabutte soils are on ballenas and fan remnants. Slopes range from 4 to 50 percent. The mean annual precipitation is about 138 millimeters (5.5 inches), and the mean annual air temperature is about 18.5 degrees C (65 degrees F).

### Taxonomic Classification

Loamy-skeletal, mixed, superactive, thermic Typic Haplargids

### Typical Pedon

Yuccabutte loam; Riverside County, California; on an east-facing, linear, 6 percent slope under desert shrubs, about 10.3 kilometers (6.4 miles) east-northeast of the Cottonwood Visitor Center located at the junction of Pintobasin and Pinkham Canyon Roads in Joshua Tree National Park; 270 meters (885 feet) west and 185 meters (605 feet) south of the northeast corner of section 3, T. 5 S., R. 12 E., San Bernardino Base and Meridian; at an elevation of 931 meters (3,054 feet); lat. 33 degrees 46 minutes 16.0 seconds N. and long. 115 degrees 42 minutes 56.6 seconds W.; USGS Conejo Well 7.5 minute topographic quadrangle; UTM 11S 0618922e 3737519n (DTM: NAD83). The surface is covered by approximately 30 percent fine gravel, 40 percent medium and coarse gravel, 8 percent cobbles, and 1 percent stones. (Colors are for dry soil unless otherwise noted.)

- A—0 to 1 centimeter (0 to 0.5 inch); light brown (7.5YR 6/4) loam, strong brown (7.5YR 4/6) moist; moderate thick platy structure; slightly hard, very friable; nonsticky and slightly plastic; few very fine and fine roots; few very fine, fine, medium, and coarse vesicular pores; 3 percent fine gravel and 2 percent medium and coarse gravel; very slightly effervescent; slightly alkaline (pH 7.6); abrupt smooth boundary. (1 to 5 centimeters thick)
- Bt1—1 to 14 centimeters (0.5 inch to 5.5 inches); yellowish red (5YR 4/6) gravelly clay loam, yellowish red (5YR 4/6) moist; weak fine subangular blocky structure; slightly hard, friable; moderately sticky and very plastic; few very fine and fine and very few medium roots; 30 percent faint yellowish red (5YR 4/6) clay films on faces of peds and rock fragments; 15 percent fine gravel, 10 percent medium and coarse gravel, and 2 percent cobbles; slightly alkaline (pH 7.4); abrupt smooth boundary.
- Bt2—14 to 52 centimeters (5.5 to 20 inches); reddish brown (5YR 4/4) very gravelly sandy clay loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky

structure; moderately hard, firm; moderately sticky and moderately plastic; very few fine roots; 30 percent distinct yellowish red (5YR 4/6) clay films on faces of peds and rock fragments; 25 percent fine gravel, 15 percent medium and coarse gravel, and 5 percent cobbles; neutral (pH 7.2); gradual wavy boundary.

Bt3—52 to 98 centimeters (20 to 38 inches); yellowish red (5YR 5/6) very gravelly sandy loam, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; slightly hard, friable; slightly sticky and nonplastic; 20 percent distinct yellowish red (5YR 4/6) clay films on faces of peds and rock fragments; 35 percent fine gravel, 5 percent medium and coarse gravel, and 3 percent cobbles; slightly alkaline (pH 7.6); gradual wavy boundary.

Bt4—98 to 135 centimeters (38 to 53 inches); yellowish brown (10YR 5/6) sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable; slightly sticky and nonplastic; 15 percent distinct strong brown (7.5YR 4/6) clay films on faces of peds; 8 percent fine gravel and 2 percent medium and coarse gravel; slightly alkaline (pH 7.8); gradual wavy boundary. (Combined thickness of the Bt horizons is 50 to 70 centimeters)

C—135 to 152 centimeters (53 to 60 inches); yellowish brown (10YR 5/6) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable; nonsticky and nonplastic; 12 percent fine gravel and 3 percent medium and coarse gravel; slightly alkaline (pH 7.8).

#### **Range in Characteristics**

*Soil moisture control section:* Usually dry; moist in some part for short periods during winter and early spring and for 10 to 20 days (cumulative) between July and September following convection storms; the soils have a typic-aridic soil moisture regime

*Soil temperature:* 19 to 22 degrees C (66 to 72 degrees F)

*Surface rock fragments:* 65 to 80 percent; including 5 to 30 percent fine gravel, 20 to 50 percent medium and coarse gravel, 10 to 15 percent cobbles, 1 to 10 percent stones, and 0 to 3 percent boulders

#### *Control section:*

Rock fragments—average of 40 to 90 percent; gravel, cobbles, and stones

Clay content—average of 18 to 30 percent

Organic matter content—0 to 0.5 percent

Effervescence—noneffervescent throughout

Depth to the upper boundary of an argillic horizon—1 to 15 centimeters (0.5 inch to 6 inches)

#### *A horizon and Bw horizon (if it occurs):*

Value—5 or 6 dry; 3 or 4 moist

Chroma—3 or 4 dry

Clay content—12 to 25 percent

Rock fragments—5 to 60 percent; including 10 to 35 percent gravel, 0 to 30 percent cobbles, and 0 to 15 percent stones

Effervescence—noneffervescent or very slightly effervescent

#### *Bt horizon:*

Hue—5YR, 7.5YR, or 10YR

Value—4 or 5 dry

Chroma—4 to 8 dry; 4 to 6 moist

Texture of the fine-earth fraction—sandy loam, loam, sandy clay loam, or clay loam

Clay content—18 to 35 percent in the upper part of horizon and 10 to 18 percent in the lower part



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Rock fragments—5 to 90 percent; ranging from 25 to 90 in the upper part (including 25 to 50 percent gravel, 0 to 30 percent cobbles, and 0 to 30 percent stones) to 5 to 10 percent (mostly) gravel in the lower part

Reaction—neutral or slightly alkaline

Other features—noneffervescent to a depth of at least 100 centimeters

### *C horizon (if it occurs):*

Clay content—5 to 8 percent

Rock fragments—15 to 30 percent gravel



# Formation of the Soils

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This section describes the factors of soil formation and relates them to the soils in the survey area. It also discusses the processes of soil formation.

## Factors of Soil Formation

Soil is generally defined as a natural medium for the growth of plants. It is a three-dimensional body at the surface of the earth and is composed of organic and mineral material. Soil characteristics are the result of physical and chemical processes produced by a combination of five factors: parent material, topography, climate, living organisms, and time. The influence of any one of these factors can vary from place to place; hence, soils can differ within short distances in the same locality. Soils often are defined in terms of these factors as “dynamic natural bodies having properties derived from the combined effect of climate and biotic activities, as modified by topography, acting on parent material over periods of time” (Brady, 1990).

Joshua Tree National Park is on the eastern end of the broad mountainous belt called the Transverse Ranges. This area stretches from Point Arguello, 50 miles (80 kilometers) west of Santa Barbara, eastward for nearly 300 miles (480 kilometers) to the Eagle Mountains in the Mojave Desert (Trent, 1998).

Over the last several millennia, the soils in this area have undergone significant changes because of variations in climate, kinds and amounts of living organisms in the area, kinds of rock, topography, and age of land surfaces. Sixty of the 102 soils mapped within Joshua Tree National Park are endemic to the survey area. Several of the soil properties that make these soils distinct are discussed below in more detail.

Soils are classified, mapped, and interpreted on the basis of various kinds of soil horizons and their arrangement. The degree and expression of the soil horizons is a reflection of the extent of the interaction of soil-forming factors with one or more soil-forming processes, including additions, removals, transfers, and transformations (Simonson, 1959). Important diagnostic surface horizons in this survey area include ochric epipedons. Some of these epipedons are characterized by significant quantities of vesicular pores. Significant diagnostic subsurface horizons include cambic, argillic, calcic, and petrocalcic horizons and duripans. The Glossary defines these diagnostic horizons.

Each soil-forming factor as well as their influence on the development of soils in the survey area is summarized in this section.

## Climate

Climate has perhaps the strongest influence on soil formation because it determines the nature of the weathering that occurs. Temperature and moisture affect the rates of the chemical, physical, and biological processes responsible for soil development. Factors which are largely controlled by climate include the amount and kind of vegetative growth, the rate of organic matter decomposition, the rate at which rocks

and minerals weather, the types of secondary minerals which form, and the kinds of processes which lead to weathering. Temperature and moisture are important in the removal and accumulation of material in soil horizons, while wind and moving water influence the removal and accumulation of material on the soil surface.

Most of the survey area is in an arid soil moisture regime. This regime is characterized by an arid desert climate consisting of hot, dry summers; warm, slightly moist winters; and very little rainfall. Presumably, this climate is similar to the one under which most of the soils of the Holocene formed. The climate is considered to have been cooler and moister during the Pleistocene. Although approximately half of the precipitation in the area falls in winter, significant summer thunderstorms and accompanying showers are not uncommon. The showers are normally intense and of short duration. Approximately 20 to 30 percent of the annual precipitation falls as a result of these summer convection storms.

Two soil temperature regimes occur in the park: thermic and hyperthermic. In general, soils in the thermic temperature regime occur at elevations above 790 meters (2,600 feet) while soils in the hyperthermic temperature regime occur at elevations below 790 meters. Arizo and Carrizo soils, which are in thermic and hyperthermic soil temperature regimes, respectively, are examples of two very similar soils that are differentiated on the basis of soil temperatures. At a depth of 50 centimeters, the thermic soil temperature regime has a mean annual soil temperature of 15 to 22 degrees C (59 to 72 degrees F) while the hyperthermic soil temperature regime has a mean annual soil temperature of 22 to 28 degrees C (72 to 82 degrees F).

The majority of the fan piedmonts, low hills, and mountains in the central and eastern parts of the park are characterized by average annual air temperatures ranging from 20 to 23 degrees C (68 to 73 degrees F) and annual average precipitation ranging from 75 to 125 millimeters (3 to 5 inches). This area includes Pinto Basin; the Pinto, Eagle, Coxcomb, and Cottonwood Mountains; and parts of the Hexie and Little San Bernardino Mountains. Blackeagle soils are the common soils on the mountains in this area. These soils have bedrock at a depth of 50 centimeters and, in most areas, a strong cambic horizon. The cambic horizon indicates that although moisture content was low there was enough moisture for the significant weathering of the bedrock and the differentiation of individual soil horizons.

Most of the remainder of the park, except for the areas discussed below, have average annual air temperatures of 17 to 20 degrees C (62.5 to 68 degrees F) and average annual precipitation of 100 to 175 millimeters (4 to 7 inches). In the Queen's Valley/Jumbo Rocks area, Pinecity and Desertqueen soils are the common soils on the pediment surfaces surrounding the uplifted White Tank Formation and Morongo soils are the common soils on the broad fan aprons adjacent to the hills and pediments. Pinecity and Desertqueen soils are shallow and very shallow to weathered granite (figs. 79 and 80). Morongo soils are very deep, sandy, and alluvial. Desertqueen soils are unique in that they formed in the most stable areas of the pediment and in areas with high rates of surface run-on, which has allowed greater amounts of water to infiltrate the soils over time. These soils have an argillic horizon above the weathered bedrock as a result of translocation and transformation of clays due to greater amounts of soil moisture.

Areas at the higher elevations on the Little San Bernardino Mountains on the west side of the park are characterized by average annual air temperatures of 13 to 17 degrees C (55.5 to 62.5 degrees F) and average annual precipitation of 175 to 250 millimeters (7 to 10 inches). Smithcanyon soils are an example of soils in this area (fig. 81). They are in a transition zone between the arid soil moisture regime and the xeric soil moisture regime and have an arid soil moisture regime bordering on xeric. A xeric soil moisture regime is typical in Mediterranean climates and differs from an arid soil moisture regime primarily because it has cooler temperatures year-round.



**Figure 79.—An example of a Desertqueen soil that has an argillic horizon above weathered bedrock. (Scale is in centimeters.)**

and more precipitation during the winter months. Soils in this transition zone are often able to support larger vegetation species, such as scrub oak, California juniper, and pinyon pine, because of the combination of higher amounts of rainfall, cooler temperatures, and the presence of soil moisture for longer periods.

The base of the Little San Bernardino, Eagle, and Cottonwood Mountains forms the northern border of a climatic zone that has a relatively small acreage within the park but has significant differences in precipitation and temperature compared to the rest of the park. This zone is representative of the Colorado Desert and has average annual air temperatures of 23 to 26 degrees C (73 to 79 degrees F) and average annual precipitation of 50 to 100 millimeters (2 to 4 inches). While this area falls within the hyperthermic soil temperature regime, its unique climatic differences, which result in virtually no temperatures below freezing, allow it to support vegetation species which





**Figure 80.—An example of a Pinecity soil that is shallow to weathered bedrock.  
(Scale is in centimeters.)**

do not occur in other hyperthermic areas of the park. Rizzo and Goldrose soils are two common soils on fan aprons and in drainageways in this area.

The climate and soils strongly influence which plant species will grow in desert areas. Low amounts of rainfall combined with high summer temperatures result in insufficient leaching of carbonates, soluble salts, and alkali from the root zone of desert soils. Consequently, desert soils typically support communities of dominantly xerophytic and halophytic vegetation. The surface layer of desert soils typically has less than one-half of one percent organic matter. The low content of organic matter

is due to both the high summer temperatures, which contribute to rapid oxidation of existing organic matter, and low amounts of rainfall, which result in the production of only a small amount of vegetation.

The low precipitation and limited natural leaching inherent to a desert climate help to promote the accumulation of soluble materials in the soil. The downward percolation of water through the soil transports soluble materials to the depth of the wetting front, where they precipitate and accumulate. Soil horizonation is generally affected. The two most common soluble materials in desert soils are silica and carbonate. The accumulation of carbonate at the wetting front has produced a calcic horizon. Buzzardsprings and Supplymine soils have a calcic horizon. In some cases, precipitation over long periods of time, or from a paleoclimatic period, has formed a cemented or indurated layer that is only penetrable by great effort or by heavy machinery. Silica and carbonate are often precipitated together at the wetting front. A duripan is a cemented or indurated layer in which silica is the dominant cementing agent; a petrocalcic horizon is cemented dominantly by carbonate. Rainbowsend soils are an example of soils that have an indurated duripan (fig. 82). Perurose soils have a duripan which is less cemented and can usually be excavated with a spade or digging bar. Gocougs soils are an example of soils with a petrocalcic horizon.



Figure 81.—A profile of a Smithcanyon soil that is very shallow to weathered bedrock. (Scale is in centimeters.)



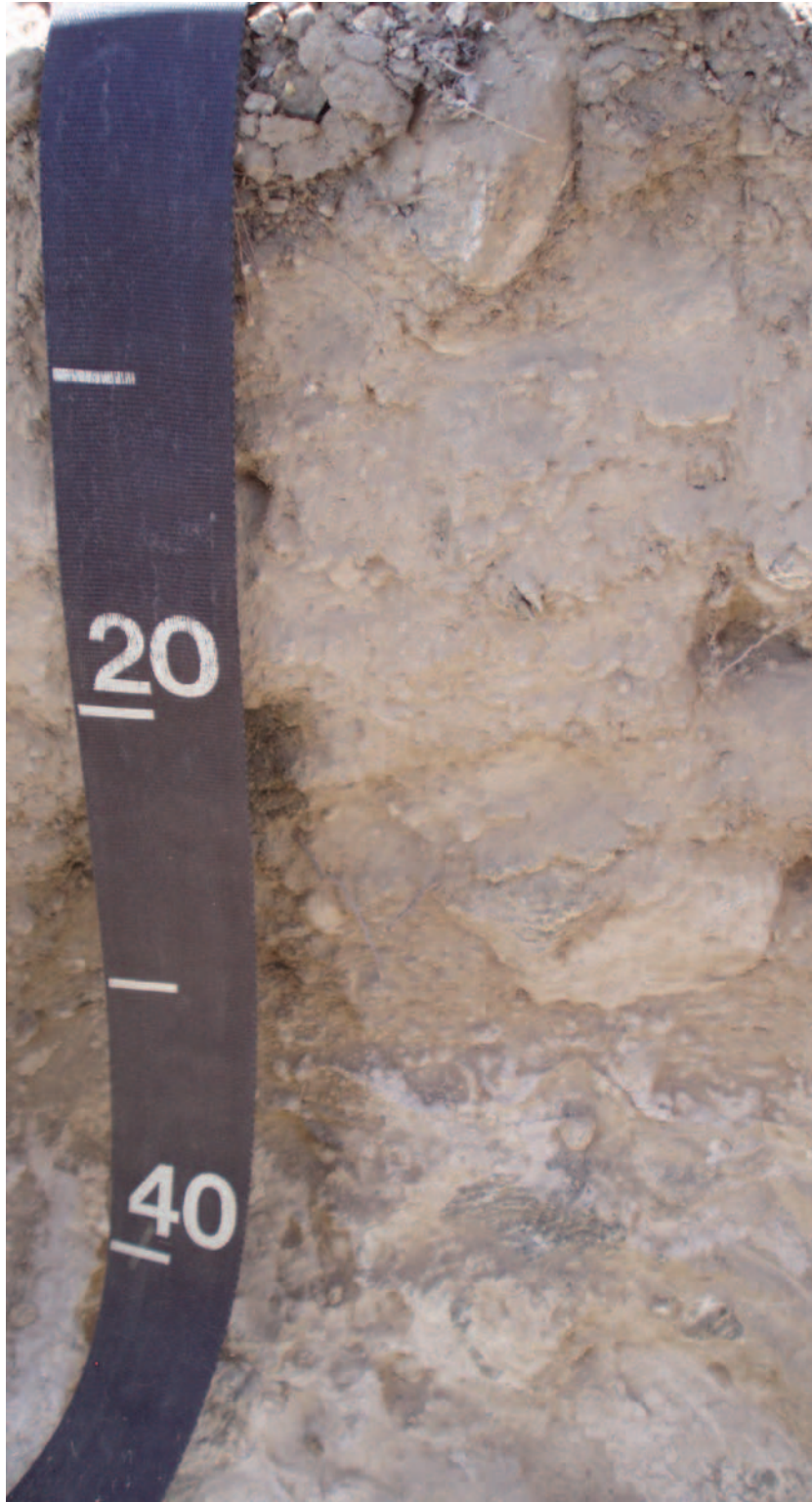


Figure 82.—An example of a Rainbowsend soil that is shallow to an indurated duripan. (Scale is in centimeters.)

Gusting winds and duststorms commonly occur in the survey area. They transport and rework surface material such as carbonate dust, salts, and soil. For example, sand has been deposited on the surface of most areas of Dalelake soils.

Strong horizonation is a characteristic of the soils on old, stable remnant geomorphic surfaces that occur throughout the survey area. Certain characteristics of these soils formed during cool, moist paleoclimatic periods. The red argillic horizon is considered a relict of the pluvial climate of the Pleistocene (Nettleton and others, 1975). Bluecut and Pinkcan (fig. 83) are examples of soils that have a well developed argillic horizon. Duripans, durinodes, and petrocalcic horizons are other features that may have formed in a paleoclimate.

The strong profiles of some desert soils developed during moist climatic periods when water was more plentiful. Water is the primary reactant in hydrolysis, a weathering reaction that chemically releases elements in parent rock for transformation into secondary minerals or for translocation in solution. Organic matter aids the weathering process by supplying additional hydrogen ions for the reaction.

Iron is an element released by hydrolysis from both the secondary clay minerals and the primary minerals. Free iron is released during wet periods, when weathering occurs and when water moves through the soil. Iron coats the clay particles, sand grains, and surfaces of peds to the depth of the wetting front, turning them red. This results from the amorphous iron hydroxide dehydrating into oxides of iron, such as hematite. A moist period is required to initially release and transport the iron, and a subsequent dry period is required to rehydrate it (Cooke and Warren, 1973). The degree of redness in a soil horizon is an indicator of the degree of development. Most of the soils that have an argillic horizon show evidence of this reaction by having a layer that is distinctly redder than the rest of the profile. Many of the soils in the park have argillic horizons, including Oldale and Helendale. While these soils are in different soil temperature regimes today and could not form in the current climate, the degree of development in their argillic horizons is evidence of the paleoclimate under which they formed.

## Living Organisms

Organisms influence the formation of soils in several ways. Organic matter accumulation, profile mixing, nutrient cycling, and structural stability are all enhanced by the activity of soil organisms. Earthworms, insects, and small burrowing animals help incorporate and mix organic matter into the soil. Earthworms and other small invertebrates feed on the organic matter in the upper few inches of the soil. They slowly but continually mix the soil material and make it more permeable to water. Bacteria, fungi, algae, actinomycetes, and other microorganisms hasten the weathering of rocks and the decomposition of organic matter.

Vegetation plays an important role in many biological forces that affect the formation of soils. Plants, animals, insects, bacteria, fungi, and other organisms add organic matter to the soils. The kind of vegetation that grows on the soil influences the cycle of nutrient transfer and return. Because vegetation and other organisms are so closely associated with soil and because both soil and vegetation are dependent on climate, the combination of soil and vegetation can be considered a single system (Cooke and Warren, 1973).

In the survey area, the vegetation is mostly desert shrubs with a thin understory of annual grasses and forbs. Perennial grasses make up only a small percentage of the plant community and add little humus to the surface layer. Typically, the soils have a light-colored surface layer that has a very low content of organic matter. This surface layer, called an ochric epipedon, is typical of all the Aridisols and Entisols in the survey area. Vegetative cover reduces natural soil erosion rates, thereby slowing the rate of mineral surface removal (Brady, 1990).



Figure 83.—An example of a Pinkcan soil with a reddened argillic horizon and visible secondary calcium carbonate. (Scale is in centimeters.)

## Parent Material

Parent material is the unconsolidated material in which soil forms. Geological processes have produced numerous parent materials. The nature of the parent material profoundly influences soil characteristics (Brady, 1990). For example, parent materials largely influence soil texture. In turn, soil texture helps to control the



downward movement of water, thereby affecting the translocation of fine soil particles and plant nutrients. In addition, the chemical and mineralogical compositions of parent material can influence weathering directly. Parent material also influences the type and quantity of clay minerals present in the soil profile (Brady, 1990). The parent material itself may contain varying amounts and types of clay minerals, perhaps from a previous weathering cycle. The nature of parent material also greatly influences the kinds of clay that can develop as the soil evolves. In turn, the nature of the clay minerals present markedly affects the kind of soil that develops.

Soils in the survey area formed mainly in residuum and alluvium. The soils that formed in residuum are mainly on the bedrock-controlled hills, mountains, and pediments. Alluvium eroded from these upland areas has formed constructional alluvial surfaces. The soils that formed in alluvium are on the alluvial fans and fan aprons at the base of the mountains. Most of the soils in the survey area formed in alluvium. Nearly all the alluvium in the park is from either granitoid or gneissic mineralogy, or a combination of both, and the composition of the alluvium varies according to the source material. Cajon and Morongo soils formed in alluvium in which granitoid material was dominant.

Some soils formed in residuum weathered from hard, metamorphic rock, such as gneiss. Blackeagle soils occur on gneiss-dominant mountains in the survey area. Aguilareal, Ironped, Impedimenta, and Pinecity soils formed in residuum on pediments and the steep slopes of hills and mountains in the survey area. They are typically between 3 and 50 centimeters deep to weathered or hard bedrock.

## Topography

Topography is related to the configuration of the land surface and is described in terms of differences in elevation, slope, aspect, etc. Topography affects the formation of soils through its effect on climatic influences, drainage, runoff, erosion, deposition, landform stability, and plant cover. Elevation and aspect, or direction of slope exposure, are topographic factors that can influence local climatic conditions. Slope characteristics such as shape, length, and gradient affect soil drainage, runoff, erosion, and deposition patterns. Topography is largely determined by the geology of the underlying formations; by uplifting, folding, and faulting; and by past cycles of erosion and dissection by rivers and streams. Knowledge of topography is useful in understanding the genesis and morphology of soils in a survey area.

The excessively drained and somewhat excessively drained Rizzo and Pintobasin soils have no drainage restrictions. They are typical of the nearly level to moderately sloping soils that occur on recent broad alluvial fans and fan aprons and on narrow inset fans throughout the survey area. Rizzo and Pintobasin soils are Entisols and have very little to no profile development.

Many of the fan piedmonts in the park have soils which show significant profile development. Many of these soils are on relict surfaces that have been largely protected from erosion or burial. The soils on these fan remnants formed during a previous paleoclimatic period (as described above) and are commonly characterized by the development of a thick solum and a reddish argillic horizon. These soils include Aquapeak, Pinkcan, and Rockhound, which are all Aridisols.

## Time

The length of time that materials have been subjected to weathering influences soil formation. Generally, the degree of profile development is related to the age of the soil and long periods of time are required for soil formation. The age of a soil generally is not related to the geologic age of the parent rock or alluvium; the action and interaction of the soil-forming factors determine it.

Cajon, Morongo, and Pintobasin are the young soils in the survey area. They formed in Holocene alluvium and exhibit very little profile development. Oldale and Rockhound soils occur on varnished desert pavements of Pleistocene age, which have evidently been stable since the mid-Pleistocene. These two soils have a well developed argillic horizon. A sandy or sandy and gravelly horizon with little or no development is below the argillic horizon of these soils.

The presence of a calcic horizon in arid areas is an indication of surface stability that has lasted an extended period of time. Calcic horizons have developed in Buzzardsprings, Ironage, and Sunmill soils (fig. 84). The calcic horizon forms when dust containing carbonates is deposited on the soil surface. Over time, the carbonates in the dust move deeper into the soil profile as they follow the wetting front. They accumulate at the greatest depth that moisture typically reaches.

The role of time in soil development is especially evident where geomorphic surfaces have been undisturbed by erosion or deposition processes. Yuccabutte and Mekkadale soils occur on fan remnants in these areas.

## **Processes of Soil Formation**

Many different kinds of soil have formed in the survey area. Some soils have little horizon differentiation while others exhibit strong profile development. Ongoing soil-forming processes and horizonation are evident in desert soils; however, the extreme extent of soil development in some old soils, particularly those on old, stable remnant surfaces, are the result of processes inherent to a moist paleoclimate (USDA-SCS, 1986).

Several processes are involved in the formation of soils. These processes include the accumulation of organic matter, the formation and translocation of silicate clay, the accumulation of silica and lime, and the weathering of parent material. The differentiation of horizons is the result of one or more of these processes.

### **Accumulation of Organic Matter**

The amount of organic matter accumulated in desert soils, such as Pintobasin, is insignificant. Pintobasin soils have an aridic moisture regime and a pale ochric epipedon and support a sparse plant cover. This indicates that little organic matter has accumulated in the soils. In contrast, prairie soils have a dark surface layer which supports a dense cover of grasses. The difference results from the minimal moisture available for plant growth and the rapid oxidation of organic matter in the hot and dry desert.

### **Formation and Translocation of Silicate Clay**

These processes are affected by the degree to which the parent material has weathered and the depth to which the clay-forming minerals have leached. Paleoclimatic moisture would have promoted intense weathering and facilitated the deep percolation of water required to translocate minerals and promote clay formation. The results of these processes are evident in the thick, well developed Bt or Btk horizon of Oldale and Pinkcan soils. The subsoil in these soils is thick because the wetting front was deeper than it is under the present climate.

### **Accumulation of Silica and Lime Under the Paleoclimatic Influence**

Soluble silica percolates downward in the soil and moves laterally downslope on fans. Periodic wetting and drying promote the formation of durinodes or a duripan and laminar opal caps after sufficient silica has accumulated. Missionsweet and Rainbowsend are examples of soils with a prominent duripan.

Soluble carbonates accumulate at the base of the wetting front, where the cycle of wetting and drying promotes the precipitation of calcium carbonate. As a result, a



**Figure 84.—An example of a Sunmill soil with a visible reddened argillic horizon and common visible secondary calcium carbonate. This soil has enough calcium carbonate to be considered a Typic Calciargid. (Scale is in centimeters.)**



calcic horizon forms, as in Buzzardsprings and Supplymine soils. Petrocalcic horizons form when the dominant cementing agent is carbonate rather than silica. In some cases, a laminar capping of silica-enriched cemented calcium carbonate forms over the petrocalcic horizon. Gocougs soils have a petrocalcic horizon.

### **Weathering of Parent Materials**

It is not completely understood how historical influences have affected the rate of weathering in the survey area. The arid conditions and fluctuating temperatures of the present-day desert promote physical weathering processes, such as expansion and contraction, which are caused by heating and cooling or wetting and drying. These processes require a long period of time to strongly affect the development of soils. A moister climate promotes chemical processes such as hydrolysis. Hydrolysis contributes to the intense weathering required for strong profile development in a short period of time.

Complex patterns of erosion and deposition further complicate the understanding of weathering in the park. For example, well developed soils have been removed, covered, or truncated or they have been left as relict soils on isolated stable surfaces.

Evidence of paleoclimatic moisture is abundant. Increased amounts of moisture account for the degree of weathering and development of the soils on the stable remnant surfaces. For instance, iron is released by hydrolysis, during wet periods, from primary minerals as well as from the secondary clay minerals. The free iron moves through the soil with the water and coats clay particles, sand grains, and surfaces of peds. This coating is evident as a distinct reddish color in the soil to the depth of the wetting front. The thickness of the affected horizons and the depth to which this reddish color can be seen in some soils indicates a climatic regime which was significantly wetter than the present one. In addition to free iron, clay particles, silica, and calcium carbonate were carried deeper into the profile to accumulate at the depth of the wetting front during this climatic period. Today, there is further evidence of this wetter paleoclimatic period in many soils in the survey area as argillic horizons, calcium carbonate masses within horizons, silica pendants on rock fragments, duripans or petrocalcic layers, or combinations of these features. Soils that exhibit the accumulation of iron oxides in conjunction with an argillic layer include Friedliver, Helendale, Joetree, Jumborox, Oldale, Werewolf, and Yuccabutte. Soils that have the accumulation of calcium carbonate as masses in the horizon or on rock fragments, with or without the presence of an argillic horizon, include Buzzardsprings, Gocougs, Ironage, Patscamp, Russiroks, and Supplymine. In many soils, silica is the dominant particle transported by water moving through the soil. In some soils there has been such a significant accumulation of silica that a cemented layer, or duripan, has formed. In most cases there has been sufficient calcium carbonate transported that it contributes to the cementation of this layer. Soils that exhibit a duripan cemented dominantly by silica include Carpetflat, Cospin, Minhoyt, Missionsweet, Perurose, and Rainbowsend. Other soils exhibit an argillic horizon as well as a duripan. Examples of soils with an argillic horizon and a duripan include Aquapeak, Deprave, Kenalduma, Mekkadale, and Pinkcan. The length of time these surfaces have remained undisturbed has also contributed to the strong development and continued visibility of paleoclimatic features in these soils.

### **Formation of Desert Pavement**

Desert pavements are perhaps one of the most distinctive features in arid and semi-arid environments (fig. 85). Desert pavement is an armored surface of closely packed, angular to subrounded rock fragments or clasts. Desert pavements usually exhibit very little relief, are darkly varnished, and occur above a relatively gravel-free layer in which a moderately to strongly developed soil has formed (McFadden and others, 1987).



Figure 85.—An example of desert pavement on the south side of the park, in MLRA 31.

Desert pavements are believed to form from rock fragments deposited on the surface layer from higher topographic areas. They are maintained at the surface by the progressive accumulation of eolian dust below the rock fragments and the concomitant growth of an underlying vesicular layer. Once a desert pavement is established, the soil below it has an armored surface that protects it from further erosion. The stability of the pavement regulates the processes of soil formation. As a result, horizon development is strong and often unique. Soils under a desert pavement normally have a strongly developed argillic horizon.

Pavement surfaces are essentially barren of vegetation, which is another striking feature of the landscape. Often, the only plant cover in the Colorado Desert is very sparse and widely spaced creosote bush (*Larrea tridentata*) or sparse creosote bush and desert ironwood (*Olneya tesota*). Several conditions may be responsible for limiting the development of vegetation on pavement surfaces. The tightly packed pavement may directly shed a considerable amount of water and limit water infiltration. The fine textured vesicular layer beneath the pavement also impedes infiltration and effectively reduces the available water capacity (McAuliffe and McDonald, 1995; Musick, 1975). Another possibility is that the interlocking nature of the rock fragments composing the pavement and the crusting effect of the vesicular layer make seedling germination difficult or impossible.

The soil under a desert pavement characteristically has a thin, vesicular A horizon that is 1 to 4 inches (2 to 10 centimeters) thick (fig. 86). This horizon forms in eolian-deposited silts and fine sands, is generally free of gravel, and has abundant spherical vesicles or pores (Springer, 1958). It tends to have higher contents of silt and clay than the underlying alluvial horizons due to its eolian origin, which is especially evident on





**Figure 86.—A close-up of vesicular pores found in an A horizon directly below desert pavement on stable fan remnants. The remnants are just outside the park in an adjacent survey area. Soils such as the Oldale soil in map unit 2076 within the park exhibit this soil characteristic. (Photo taken by Judith Turk, University of California—Riverside.)**

the most stable surfaces (Turk and Graham, 2011). The formation of the pores results when air is trapped during wetting and expands as the surface is heated during drying, leaving imprints as discontinuous, spherical vesicular pores (Evanari and others, 1974). These pores impede water infiltration, which causes water to remain at the soil surface, and increase runoff and evaporation rates (Eckert and others, 1978). Two soils within the park that are covered with desert pavement and contain an A horizon characterized by vesicular pores are Oldale and Goldenbell.

The soil under a desert pavement may also be a unique source of nitrogen (Graham and others, 2008). Studies within the Mojave Desert, including a stable fan remnant within Pinto Basin, show that nitrogen levels in the horizons directly below the desert pavement are one to two magnitudes higher than in soils without a pavement. Oldale soils were examined as part of this study.

Desert varnish is a thin, very dark or black, mineralized layer on the surface of the rock fragments in a desert pavement. It is one of the most prominent features of the desert landscape. The varnish is at least 70 percent clay and has a higher content of iron oxide and manganese oxide than the underlying rock (Potter and Rossman, 1977). The varnish on the upper surface of the fragments is dark and has a higher content of manganese oxide. The varnish on the underside of fragments is reddish and has a higher content of iron oxide.

Because the varnish has a distinct morphology, it is believed to form from constituents supplied by external sources. These sources may include windborne material and particles from the surrounding soils that are sorted in solution and carried to the surface of the fragment. Although the formation of a desert varnish

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varies with local conditions and has been known to form in as little as 25 to 50 years, it is generally accepted that its formation is the result of a long, slow process, which in some cases may be as long as 20,000 to 50,000 years (Engel and Sharp, 1958). Soils in the survey area with a desert pavement and desert varnish include Carpetflat, Oldale, and Rockhound.



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# Glossary

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**AASHTO classification.** A system for classifying soils specifically for geotechnical engineering purposes that is related to highway and airfield construction. It is based on particle-size distribution and Atterberg limits.

**AC soil.** A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Alluvial cone.** The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

**Alluvial fan.** A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes, shaped like an open fan or a segment of a cone, deposited by a stream (best expressed in semiarid regions) at the place where it issues from a narrow mountain or upland valley or where a tributary stream is near or at its junction with the main stream. It is steepest near its apex which points upstream and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

**Alluvial flat.** A nearly level, graded, alluvial surface in bolsons and semibolsons that lacks distinct channels, terraces, or flood-plain levels.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Alpha,alpha-dipyridyl.** A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

**Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Aridic soil moisture regime.** The moisture control section is, in normal years:

1. Dry in all parts for more than half of the cumulative days per year when the soil temperature at 50 centimeters below the soil surface is above 5 degrees C;  
*and*
2. Moist in some or all parts for less than 90 consecutive days when the soil temperature at 50 centimeters below the soil surface is above 8 degrees C.

**Arroyo.** The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

**Aspect.** The direction in which a slope faces.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low .....	0 to 3
Low .....	3 to 6
Moderate.....	6 to 9
High .....	9 to 12
Very high.....	more than 12

**Backslope.** The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

**Badland.** Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

**Bajada.** A broad alluvial slope extending from the base of a mountain range out into a basin and formed by coalescence of separate alluvial fans.

**Ballena.** A fan remnant having a distinctively rounded surface of alluvium. The ballena's broadly rounded shoulders meet from either side to form a narrow summit and merge smoothly with concave side slopes. The side slopes merge with concave, short pediments which form smoothly rounded drainageways between adjacent ballenas.

**Basal area.** The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

**Basal till.** Compact glacial till deposited beneath the ice.

**Basalt.** A dark, fine grained, igneous rock composed mainly of plagioclase and pyroxene minerals. It most commonly forms as an extrusive rock, such as a lava flow.

**Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

**Base slope.** A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

**Bedding planes.** Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

**Bedding system.** A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

**Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

- Bedrock-controlled topography.** A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.
- Bench terrace.** A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.
- Biological soil crusts.** Also referred to as microbiotic, cryptogamic, or microphytic crusts. These crusts which form at the soil surface are made up of microbial communities of diverse taxa and are associated with a wide array of ecological functions, such as nitrogen and carbon fixation, water retention and infiltration, and biological weathering.
- Biotic name.** A naming convention used in ESIS (Ecological Site Information System) to identify the most successional advanced natural plant community by dominant species. Up to two dominant species can be listed for each life form (tree/shrub/herb) by scientific and common names.
- Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.
- Blowout.** A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.
- Bottom land.** The normal flood plain of a stream, subject to flooding.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Breaks.** The steep and very steep broken land at the border of an upland summit that is dissected by ravines.
- Breast height.** An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.
- Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
- Butte.** An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.
- Cable yarding.** A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.
- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- Calcic horizon.** An illuvial horizon in which secondary calcium carbonate or other carbonates have accumulated to a significant extent.
- Calcium carbonate equivalent.** The amount of carbonates in the soil as measured by treating the sample with hydrogen chloride (HCl).
- Cambic horizon.** This horizon is the result of physical alterations, chemical transformations, or removals or of a combination of two or more of these processes.
- Canopy.** The leafy crown of trees or shrubs. (See Crown.)
- Canyon.** A long, deep, narrow, very steep-sided valley with high, precipitous walls in an area of high local relief.



- Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.
- Catena.** A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.
- Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.
- Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.
- Cement rock.** Shaly limestone used in the manufacture of cement.
- Channery soil material.** Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a chanter.
- Chemical treatment.** Control of unwanted vegetation through the use of chemicals.
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Clay depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.
- Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.
- Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.
- Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
- Coarse textured soil.** Sand or loamy sand.
- Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.
- Cobbly soil material.** Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.
- COLE (coefficient of linear extensibility).** See Linear extensibility.
- Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.
- Conglomerate.** A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of

sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

**Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

**Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Coppice dune.** A small dune of fine grained soil material stabilized around shrubs or small trees.

**Coprogenous earth (sedimentary peat).** Fecal material deposited in water by aquatic organisms.

**Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

**Crown.** The upper part of a tree or shrub, including the living branches and their foliage.

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.

**Dense layer** (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

**Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Desert pavement.** A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface.

**Dip slope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

**Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Drainage class** (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained*, *somewhat excessively drained*, *well drained*, *moderately well drained*, *somewhat poorly drained*, *poorly drained*, and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Drainageways.** In general, a course or channel along which water moves in draining an area; in soil survey, a term restricted to relatively small, roughly linear or arcuate depressions that move concentrated water at some time and either lack a defined channel (e.g., head slope or swale) or have a small defined channel (e.g., low-order stream).

**Draw.** A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

**Drumlin.** A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

**Duripan.** A subsurface horizon that is cemented by illuvial silica to the degree that less than 50 percent of the volume of air-dry fragments slake in water or during prolonged soaking in acid (HCl).

**Ecological site.** An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

**Electrical conductivity (EC).** The conductivity of the water extracted from saturated paste. EC is used to determine the total content of salts. It is reported as dS/m (deciSiemens per meter).

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

**Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

**Epipedon.** A soil horizon that has developed at the soil surface in which the rock structure has been destroyed and has either been darkened by organic matter or eluviated. Thin alluvial or eolian deposits may cover it.

**Episaturation.** A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion* (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion* (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

**Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

**Extrusive rock.** Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

**Fan apron.** A sheet-like mantle of relatively young alluvium and soils covering part of the surface of an older fan piedmont (and, in some areas, an alluvial fan). It is

commonly thicker and further down slope (e.g., on a mid-fan or mid-fan piedmont) than a fan collar. It somewhat buries an older soil that can be traced to the edge of the fan apron where the older soil emerges as the land surface or relict soil. No buried soils occur within a fan apron mantle itself.

**Fan piedmont.** The most extensive landform on piedmont slopes. It is formed by either the lateral, downslope coalescence of mountain-front alluvial fans into one generally smooth slope with or without the transverse undulations of the semi-conical alluvial fans or by accretions of fan aprons.

**Fan remnant.** A general term for a landform that is the remaining part of older fan landforms, such as alluvial fans, fan aprons, inset fans, and fan skirts, that either have been dissected (erosional fan remnants) or partially buried (nonburied fan remnants). An erosional fan remnant must have a relatively flat summit that is a relict fan surface. A nonburied fan remnant is a relict surface in its entirety.

**Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**Fibric soil material (peat).** The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

**Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

**Fill slope.** A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

**Fine textured soil.** Sandy clay, silty clay, or clay.

**Firebreak.** An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

**Flaggy soil material.** Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

**Flagstone.** A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

**Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

**Fluvial.** Of or pertaining to rivers; produced by river action, as a fluvial plain.

**Foothill.** A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

**Footslope.** The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

**Forb.** Any herbaceous plant not a grass or a sedge.

**Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.

**Forest type.** A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

**Fragipan.** A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has

a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

**Fragments.** Unattached, cemented pieces of bedrock, bedrock-like material, durinodes, concretions, nodules, or pedogenic horizons (e.g., petrocalcic fragments) 2 millimeters or larger in diameter and woody material 20 millimeters or larger in diameter in organic soils. Fragments are separated into three types: rock fragments, pararock fragments (which are distinguished by cementation class), and wood fragments. The words “rock” and “pararock” are used here in the broad sense and do not connote only natural fragments of geologic material.

**Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

**Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

**Gneiss.** A metamorphic rock characterized by banding caused by the segregation of different types of rocks, typically of light and dark silicates.

**Granite.** A felsic, igneous, intrusive rock containing quartz and orthoclase with smaller amounts of sodic plagioclase and commonly muscovite.

**Granitoid.** A plutonic rock that has between 20 and 60 percent quartz.

**Gravel.** Rounded or angular fragments of rock as much as 3 inches (7.6 centimeters) in diameter. An individual piece is a pebble.

**Gravelly soil material.** Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

**Ground water.** Water filling all the unblocked pores of the material below the water table.

**Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

**Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Hard to reclaim** (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Head out.** To form a flower head.

**Head slope.** A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

**Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

**Holocene.** The epoch of the Quaternary period of geologic time, extending from the end of the Pleistocene epoch (about 10 to 12 thousand years ago) to the present.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An



explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

*O horizon*.—An organic layer of fresh and decaying plant residue.

*A horizon*.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon*.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*B horizon*.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon*.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*Cr horizon*.—Soft, consolidated bedrock beneath the soil.

*R layer*.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential.

The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Igneous rock.** Rock formed by solidification from a molten or partially molten state.

Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all.

No soil is absolutely impervious to air and water all the time.

**Increasers.** Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Inset fan.** The flood plain of an ephemeral stream that is confined between the fan remnants, ballenas, basin-floor remnants, or closely opposed fan toeslopes of a basin.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake

rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2 .....	very low
0.2 to 0.4 .....	low
0.4 to 0.75 .....	moderately low
0.75 to 1.25 .....	moderate
1.25 to 1.75 .....	moderately high
1.75 to 2.5 .....	high
More than 2.5 .....	very high

**Interfluv.** An elevated area between two drainageways that sheds water to those drainageways.

**Intermittent stream.** A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Invaders.** On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

**Iron depletions.** Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

**K factor.** Soil erodibility factors Kw and Kf quantify soil detachment by runoff and raindrop impact. These erodibility factors are indexes used to predict the long-term average soil loss from sheet and rill erosion under crop systems and conservation techniques.

**K<sub>sat</sub>.** Saturated hydraulic conductivity. (See Permeability.)

**Lacustrine deposit.** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Landslide.** The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

**Large stones** (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Linear extensibility.** Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at  $\frac{1}{3}$ - or  $\frac{1}{10}$ -bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.

**Low strength.** The soil is not strong enough to support loads.

**Major land resource areas.** Major land resource areas (MLRAs) are based upon aggregations of geographically associated land resource units and identify nearly homogeneous areas of land use, elevation, topography, climate, water resources, potential natural vegetation, and soils. MLRA boundaries reflect an appropriate generalization of land resource unit boundaries (as derived from state soil

geographic database map unit boundaries). The approximate minimum size of a MLRA that may be delineated is 580,644 hectares, or 1,434,803 acres.

**Marl.** An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

**Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

**Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size.

Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Mountain.** A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

**Munsell notation.** A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

**Natric horizon.** A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

**Neutral soil.** A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

**Nodules.** Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

**Nose slope.** A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low .....	less than 0.5 percent
Low .....	0.5 to 1.0 percent
Moderately low.....	1.0 to 2.0 percent
Moderate.....	2.0 to 4.0 percent
High .....	4.0 to 8.0 percent
Very high.....	more than 8.0 percent

**Outwash plain.** A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

**Paleoclimate.** A past climate.

**Paleoterrace.** An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Peat.** Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pediment.** A gently sloping erosional surface developed at the foot of a receding hill or mountain slope. The surface may be essentially bare, exposing earth material that extends beneath adjacent uplands; or it may be thinly mantled with alluvium and colluvium, ultimately in transit from upland front to basin or valley lowland.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The movement of water through the soil.

**Permafrost.** Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

**Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable.....	less than 0.0015 inch
Very slow .....	0.0015 to 0.06 inch
Slow .....	0.06 to 0.2 inch
Moderately slow.....	0.2 to 0.6 inch
Moderate.....	0.6 inch to 2.0 inches
Moderately rapid.....	2.0 to 6.0 inches
Rapid .....	6.0 to 20 inches
Very rapid.....	more than 20 inches

- Petrocalcic.** An illuvial horizon in which secondary calcium carbonates or other carbonates have accumulated to the extent that the horizon is cemented or indurated.
- Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.
- pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)
- Piping** (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.
- Pitting** (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.
- Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.
- Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.
- Plateau.** An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.
- Playa.** The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.
- Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.
- Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.
- Potential native plant community.** See Climax plant community.
- Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.
- Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.
- Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.
- Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.
- Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.
- Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.
- Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid.....	less than 3.5
Extremely acid .....	3.5 to 4.4
Very strongly acid .....	4.5 to 5.0
Strongly acid .....	5.1 to 5.5
Moderately acid .....	5.6 to 6.0
Slightly acid.....	6.1 to 6.5
Neutral .....	6.6 to 7.3



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Slightly alkaline .....	7.4 to 7.8
Moderately alkaline.....	7.9 to 8.4
Strongly alkaline .....	8.5 to 9.0
Very strongly alkaline.....	9.1 and higher

**Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

**Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

**Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

**Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

**Rill.** A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, gravel, cobbles, stones, and boulders.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

**Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Sapric soil material (muck).** The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

**Saprolite.** Unconsolidated residual material underlying the soil and grading to hard bedrock below.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shoulder.** The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

**Shrink-swell** (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Side slope.** A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silica-sesquioxide ratio.** The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Sinkhole.** A depression in the landscape where limestone has been dissolved.

**Site index.** A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

**Slickensides.** Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

**Slick spot.** A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for slopes are as follows:

Nearly level .....	0 to 2 percent
Gently sloping .....	2 to 4 percent
Moderately sloping .....	4 to 8 percent
Strongly sloping .....	8 to 15 percent
Moderately steep .....	15 to 30 percent
Steep .....	30 to 50 percent
Very steep .....	50 percent and higher

**Sloughed till.** Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

**Slow refill** (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca}^{++} + \text{Mg}^{++}$ . The degrees of sodicity and their respective ratios are:

Slight.....	less than 13:1
Moderate.....	13-30:1
Strong .....	more than 30:1

**Sodium adsorption ratio (SAR).** A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.05
Silt .....	0.05 to 0.002
Clay.....	less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Stone line.** A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Stubble mulch.** Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Any surface soil horizon (A, E, AB, or EB) below the surface layer.

**Summit.** The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

**Temperature regimes, soil.** A system that categorizes for taxonomic purposes general, long-term soil temperature conditions at the standard depth of 20 inches or at the bedrock surface, whichever is shallower. The various regimes are defined according to the freezing point of water or to the high and low extremes for significant biological activity. The regimes, which are fully defined in “Keys to Soil Taxonomy,” are:

*Pergelic.*—Soils have a mean annual temperature less than 32 degrees F and have permafrost.

*Cryic.*—Soils have a mean annual temperature between 32 and 47 degrees F and remain cold in summer.

*Frigid.*—Soils have mean annual temperatures similar to those in cryic regimes but have an average summer temperature that is at least 9 degrees F warmer.

*Mesic.*—Soils have mean annual temperatures between 47 and 59 degrees F, and the difference between their mean summer and winter temperatures is greater than 9 degrees F.

*Thermic.*—Soils have mean annual temperatures between 59 and 72 degrees F, and the difference between their mean summer and winter temperatures is greater than 9 degrees F.

*Hyperthermic.*—Soils have a mean annual temperature greater than 72 degrees F, and the difference between their mean summer and winter temperatures is greater than 9 degrees F.

**Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Terrace** (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

**Thin layer** (in tables). Otherwise suitable soil material that is too thin for the specified use.

**Till plain.** An extensive area of nearly level to undulating soils underlain by glacial till.

**Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Toeslope.** The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

**Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

**Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

**Upland.** Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

**Valley fill.** In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

**Variegation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Varve.** A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

**Water bars.** Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

**Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

**Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

**Xeric soil moisture regime.** The typical moisture regime in areas of Mediterranean climates, where winters are moist and cool and summers are warm and dry. The moisture, which falls during the winter, when potential evapotranspiration is at a minimum, is particularly effective for leaching. In areas of a xeric soil moisture regime, the soil moisture control section in normal years is dry in all parts for 45 or more consecutive days in the 4 months following the summer solstice and moist in all parts for 45 or more consecutive days in the 4 months following the winter solstice. Also, the moisture control section in normal years is moist in some part for more than half of the cumulative days per year when the soil temperature at a depth of 50 centimeters below the soil surface is higher than 5 degrees C or for 90 or more consecutive days when the soil temperature at a depth of 50 centimeters is higher than 8 degrees C. The mean annual soil temperature is lower than 22 degrees C, and the mean summer and winter soil temperatures differ by 6 degrees C or more either at 50 centimeters below the soil surface or at a densic, lithic, or paralithic contact, if shallower.



# Tables

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# Soil Survey of Joshua Tree National Park, California

Table 1A.—Temperature and Precipitation

(Recorded in the period 1933 to 2012 at Hayfield Reservoir, California 043855)

	Temperature (degrees F)					Precipitation (inches)				
Month	Number of days					Average	High	Low	Average number of days with 0.10 inch or more	Average snowfall
	Average daily maximum	Average daily minimum	Average daily	>= 90 degrees	>= 32 degrees					
January--	65.4	39.0	52.2	0.0	6.2	0.71	6.97	0.00	2	0.1
February--	69.3	42.1	55.7	0.0	2.7	0.53	3.64	0.00	1	0.0
March----	74.6	46.1	60.4	1.1	1.1	0.43	3.06	0.00	1	0.0
April----	82.2	52.0	67.1	6.7	0.0	0.11	0.83	0.00	0	0.0
May-----	90.4	59.5	75.0	18.1	0.0	0.06	1.64	0.00	0	0.0
June-----	99.3	66.8	83.0	26.9	0.0	0.01	0.53	0.00	0	0.0
July-----	104.6	75.0	89.8	30.8	0.0	0.29	2.56	0.00	1	0.0
August---	103.1	74.2	88.7	30.5	0.0	0.51	5.06	0.00	1	0.0
September	98.4	66.9	82.7	26.7	0.0	0.42	8.77	0.00	1	0.0
October--	87.3	55.8	71.5	13.4	0.0	0.26	1.75	0.00	1	0.0
November--	74.6	45.5	60.0	0.6	0.8	0.25	1.93	0.00	1	0.0
December--	66.5	39.2	52.8	0.0	5.8	0.55	3.25	0.00	1	0.0
Yearly:										
Average	84.6	55.2	69.9	155	16.2	---	---	---	---	---
Extreme	120	14	---	---	---	---	---	---	---	---
Total--	---	---	---	---	---	4.14	12.18	0.39	9	0.1

# Soil Survey of Joshua Tree National Park, California

Table 1B.—Temperature and Precipitation

(Recorded in the period 1959 to 2012 at Joshua Tree, California 044405)

Month	Temperature (degrees F)					Precipitation (inches)				
	Average daily maximum	Average daily minimum	Average daily	Number of days		Average	High	Low	Average number of days with 0.10 inch or more	Average snowfall
				>= 90	>= 32					
				degrees	degrees					
January--	62.1	38.0	50.1	0.0	4.8	0.62	4.22	0.00	1	0.5
February--	61.7	37.7	49.7	0.0	5.0	0.48	2.23	0.00	1	0.0
March----	69.3	40.6	55.0	0.0	2.7	0.40	1.51	0.00	1	0.0
April----	75.3	44.9	60.1	1.3	0.7	0.13	0.99	0.00	0	0.0
May-----	84.5	52.3	68.4	10.3	0.0	0.18	1.70	0.00	0	0.0
June-----	92.4	59.1	75.8	19.3	0.0	0.01	0.10	0.00	0	0.0
July-----	101.3	70.8	86.1	31.0	0.0	0.33	1.52	0.00	1	0.0
August---	100.4	68.3	84.3	29.7	0.0	0.45	3.03	0.00	1	0.0
September	95.8	64.9	80.3	26.7	0.0	0.34	2.76	0.00	1	0.0
October--	81.2	53.4	67.3	5.0	0.0	0.33	1.78	0.00	1	0.0
November--	69.1	43.0	56.1	0.0	2.2	0.61	2.52	0.00	2	0.0
December--	58.2	35.8	47.0	0.0	9.8	0.79	2.37	0.00	2	1.6
Yearly:										
Average	79.3	50.7	65.0	123	25.1	---	---	---	---	---
Extreme	110	17	---	---	---	---	---	---	---	---
Total--	---	---	---	---	---	4.67	8.18	2.33	11	2.0

# Soil Survey of Joshua Tree National Park, California

Table 1C.—Temperature and Precipitation

(Recorded in the period 1935 to 2012 at Twentynine Palms, California 049099)

Month	Temperature (degrees F)					Precipitation (inches)				
	Average daily maximum	Average daily minimum	Average daily	Number of days		Average	High	Low	Average number of days with 0.10 inch or more	Average snowfall
				>= 90 degrees	>= 32 degrees					
January--	62.7	35.9	49.3	0.0	9.8	0.50	2.63	0.00	1	19.3
February--	67.4	38.9	53.1	0.0	4.9	0.42	3.19	0.00	1	1.0
March----	73.9	43.2	58.5	0.5	1.5	0.37	2.40	0.00	1	0.0
April----	81.7	49.5	65.6	6.1	0.1	0.12	1.37	0.00	0	0.0
May-----	90.7	57.4	74.0	18.5	0.0	0.07	0.86	0.00	0	0.0
June-----	99.9	65.1	82.5	27.3	0.0	0.01	0.13	0.00	0	0.0
July-----	105.1	72.1	88.6	30.9	0.0	0.54	3.12	0.00	1	0.0
August---	103.1	70.8	86.9	30.6	0.0	0.74	4.93	0.00	1	0.0
September	97.1	63.9	80.5	26.1	0.0	0.42	3.96	0.00	1	0.0
October--	85.3	52.8	69.0	10.5	0.2	0.29	3.90	0.00	1	0.2
November--	71.6	41.8	56.7	0.1	2.7	0.28	2.06	0.00	1	0.0
December--	63.0	36.0	49.5	0.0	8.8	0.51	2.46	0.00	1	10.0
Yearly:										
Average	83.4	52.3	67.9	151	28.1	---	---	---	---	---
Extreme	118	10	---	---	---	---	---	---	---	---
Total--	---	---	---	---	---	4.26	12.32	0.74	10	19.3

# Soil Survey of Joshua Tree National Park, California

Table 2.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
1220	Jadestorm-Blackeagle-Rock outcrop complex, 15 to 50 percent slopes-----	15,753	2.0
1225	Blackeagle-Rock outcrop complex, 15 to 75 percent slopes-----	58,005	7.4
1230	Jadestorm-Rock outcrop complex, 30 to 75 percent slopes-----	7,657	1.0
1240	Meccapass-Bulletproof-Rock outcrop complex, 30 to 75 percent slopes-----	18,316	2.3
1241	Meccapass-Seanna-Contactmine complex, 15 to 75 percent slopes-----	6,656	0.9
1242	Meccapass-Jadestorm-Rock outcrop complex, 15 to 75 percent slopes-----	5,651	0.7
1250	Ironlung-Rock outcrop complex, 30 to 75 percent slopes-----	4,441	0.6
1255	Goldenhills-Bulletproof-Fanhill-Whiterobe complex, 30 to 75 percent slopes-----	37,140	4.8
1260	Whiterobe-Bigbernie complex, 30 to 75 percent slopes-----	8,735	1.1
1410	Missionwell-Rock outcrop complex, 15 to 50 percent slopes-----	2,950	0.4
1415	Bolero-Rock outcrop complex, 30 to 75 percent slopes-----	3,470	0.4
1504	Rizzo association, 4 to 15 percent slopes, rubbly-----	1,166	0.1
1510	Carrizo very gravelly sandy loam, 2 to 4 percent slopes-----	8,028	1.0
1511	Carrizo complex, 2 to 8 percent slopes, flooded-----	5,479	0.7
1512	Carrizo extremely gravelly sandy loam, 2 to 8 percent slopes-----	5,090	0.7
1513	Carrizo-Rubylee complex, 1 to 4 percent slopes-----	10,311	1.3
1514	Carrizo-Pintobasin-Rubylee complex, 0 to 4 percent slopes-----	3,422	0.4
1515	Pintobasin-Carrizo complex, 2 to 8 percent slopes-----	14,955	1.9
1516	Pintobasin fine sandy loam, 0 to 2 percent slopes-----	3,877	0.5
1517	Pintobasin-Dalelake complex, 2 to 8 percent slopes-----	9,856	1.3
1520	Pintobasin loamy sand, 2 to 4 percent slopes-----	6,956	0.9
1522	Pintobasin gravelly sand, 1 to 3 percent slopes, rarely flooded-----	23,869	3.1
1523	Pintobasin-Aquapeak association, 2 to 4 percent slopes-----	2,323	0.3
1524	Pintobasin sand, 0 to 2 percent slopes-----	3,775	0.5
1525	Pintobasin complex, 2 to 4 percent slopes, flooded-----	6,147	0.8
1526	Pintobasin-Joetree-Patscamp complex, 2 to 8 percent slopes-----	10,290	1.3
1527	Pintobasin loamy sand, 4 to 15 percent slopes-----	368	*
1530	Dalelake fine sand, 0 to 4 percent slopes-----	2,580	0.3
1531	Dalelake-Pintobasin complex, 0 to 4 percent slopes-----	3,136	0.4
1540	Carrizo-Russiroks complex, 2 to 8 percent slopes-----	3,489	0.4
1541	Carrizo-Cambidic Haplodurids association, 4 to 15 percent slopes-----	89	*
1542	Carrizo complex, 4 to 15 percent slopes-----	3,109	0.4
1550	Buzzardsprings-Coxpin-Dalelake complex, 2 to 8 percent slopes-----	431	*
1555	Goldrose-Carsitas-Chemwash complex, 4 to 8 percent slopes-----	2,610	0.3
2003	Emptygun very gravelly loamy sand, 15 to 50 percent slopes-----	30	*
2060	Joetree-Dalelake-Pintobasin complex, 0 to 2 percent slopes-----	4,021	0.5
2065	Dalelake-Aquapeak-Coxpin association, 2 to 8 percent slopes-----	5,383	0.7
2067	Aquapeak-Buzzardsprings-Dalelake complex, 2 to 30 percent slopes-----	1,298	0.2
2068	Aquapeak-Carpetflat-Pintobasin complex, 0 to 4 percent slopes-----	1,820	0.2
2070	Missionsweet-Carpetflat association, 2 to 30 percent slopes-----	5,106	0.7
2075	Oldale-Missionsweet association, 0 to 15 percent slopes-----	1,300	0.2
2076	Oldale-Carrizo complex, 2 to 8 percent slopes-----	11,215	1.4
2077	Oldale-Carrizo association, 0 to 8 percent slopes-----	2,105	0.3
2085	Rainbowsend-Goldenbell complex, 4 to 50 percent slopes-----	633	*
2090	Deprave-Rockhound-Rizzo complex, 2 to 4 percent slopes-----	1,140	0.1
2091	Deprave-Roostertail association, 0 to 4 percent slopes-----	332	*
2100	Perurose-Coxpin-Pintobasin association, 2 to 15 percent slopes-----	11,324	1.5
2101	Perurose-Pintobasin complex, 2 to 8 percent slopes-----	1,441	0.2
2110	Descent association, 4 to 50 percent slopes-----	283	*
2111	Descent-Rubylee association, 8 to 50 percent slopes-----	373	*
2120	Rizzo-Deprave complex, 2 to 8 percent slopes-----	721	*
2121	Rizzo very cobbly coarse sandy loam, 4 to 15 percent slopes, rubbly-----	203	*
2130	Goldenbell-Descent association, 2 to 15 percent slopes-----	488	*
2140	Rockhound extremely gravelly loam, 4 to 15 percent slopes-----	88	*
2402	Rizzo complex, 2 to 8 percent slopes-----	1,467	0.2
2403	Rizzo-Rizzo, occasionally flooded complex, 2 to 8 percent slopes-----	1,490	0.2
2404	Rizzo complex, 2 to 8 percent slopes, channeled-----	1,090	0.1
2405	Carrizo complex, 0 to 4 percent slopes-----	1,654	0.2
2406	Pintobasin-Carrizo association, 2 to 8 percent slopes, flooded-----	1,404	0.2
2407	Pintobasin-Carrizo association, 2 to 4 percent slopes-----	372	*
2408	Rizzo complex, 2 to 8 percent slopes, flooded-----	1,020	0.1
2409	Rizzo-Chemwash-Carsitas complex, 4 to 8 percent slopes-----	1,130	0.1

See footnote at end of table.



# Soil Survey of Joshua Tree National Park, California

Table 2.—Acreage and Proportionate Extent of the Soils—Continued

Map symbol	Soil name	Acres	Percent
2420	Carsitas complex, 0 to 4 percent slopes-----	633	*
2421	Carsitas complex, 4 to 8 percent slopes-----	4,009	0.5
2431	Chemwash complex, 4 to 8 percent slopes-----	639	*
2440	Rizzo complex, 8 to 15 percent slopes-----	269	*
2715	Dalelake-Sheephole-Pintobasin complex, 2 to 8 percent slopes-----	1,788	0.2
2716	Dalelake complex, 4 to 30 percent slopes-----	187	*
2717	Dalelake-Rock outcrop-Buzzardsprings association, 4 to 30 percent slopes--	1,118	0.1
2718	Dalelake-Sheephole complex, 2 to 4 percent slopes-----	21	*
2820	Rock outcrop-Impedimenta complex, 4 to 30 percent slopes-----	3,868	0.5
2825	Rock outcrop-Supplymine-Bolero-Ironage complex, 15 to 60 percent slopes--	3,777	0.5
2830	Rock outcrop-Blackeagle complex, 30 to 75 percent slopes, dry-----	51,947	6.7
2835	Rock outcrop-Blackeagle complex, 30 to 75 percent slopes-----	36,319	4.7
2840	Rock outcrop-Jadestorm complex, 30 to 60 percent slopes-----	15,411	2.0
3110	Coppermine-Stranger complex, 8 to 50 percent slopes-----	827	0.1
3120	Aguilareal-Blackeagle-Rock outcrop complex, 30 to 60 percent slopes-----	10,090	1.3
3213	Dalvord-Aguilareal-Rock outcrop complex, 15 to 60 percent slopes-----	1,645	0.2
3242	Langwell-Rock outcrop-Helendale complex, 4 to 30 percent slopes-----	1,243	0.2
3285	Pinecity-Contactmine-Desertqueen-Rock outcrop association, 30 to 50 percent slopes-----	2,978	0.4
3286	Pinecity gravelly loamy sand, 30 to 60 percent slopes-----	3,357	0.4
3291	Smithcanyon-Stubblespring-Rock outcrop complex, 15 to 50 percent slopes---	4,075	0.5
3292	Smithcanyon-Pinecity-Rock outcrop association, 15 to 50 percent slopes---	2,554	0.3
3293	Smithcanyon-Pinecity association, 15 to 50 percent slopes-----	15,477	2.0
3294	Smithcanyon gravelly sand, 30 to 75 percent slopes-----	2,806	0.4
3295	Desertqueen-Hexie-Rock outcrop complex, 15 to 50 percent slopes-----	35,650	4.6
3296	Desertqueen-Pinecity complex, 15 to 50 percent slopes-----	8,955	1.1
3297	Desertqueen-Contactmine-Seanna complex, 8 to 30 percent slopes-----	650	*
3325	Ironped-Rock outcrop-Hexie complex, 30 to 60 percent slopes-----	16,334	2.1
3335	Xeric Torriorthents-Rock outcrop association, 15 to 75 percent slopes----	2,330	0.3
3336	Xeric Torriorthents-Bigbernie association, 30 to 75 percent slopes-----	16,519	2.1
3340	Seanna-Grubstake-Pinecity complex, 30 to 75 percent slopes-----	22,390	2.9
3345	Bigcanyon association, 30 to 75 percent slopes-----	1,149	0.1
3440	Pacific Mesa complex, 8 to 50 percent slopes-----	726	*
3509	Cajon-Friedliver complex, 2 to 8 percent slopes, moist-----	3,339	0.4
3525	Cajon-Friedliver complex, 2 to 8 percent slopes-----	4,406	0.6
3526	Cajon-Hypoint-Arizo association, 1 to 4 percent slopes-----	4,208	0.5
3611	Burntshack association, 2 to 15 percent slopes-----	1,166	0.1
3612	Burntshack association, 2 to 4 percent slopes-----	94	*
3676	Morongo loamy sand, 2 to 4 percent slopes-----	11,718	1.5
3677	Morongo sand, 2 to 4 percent slopes-----	632	*
3679	Morongo-Jumborox complex, 2 to 8 percent slopes-----	5,499	0.7
3680	Morongo loamy sand, 2 to 8 percent slopes, dry-----	3,713	0.5
3681	Morongo-Jumborox complex, 4 to 8 percent slopes, warm-----	2,035	0.3
3682	Morongo-Jumborox-Urban land complex, 4 to 8 percent slopes-----	36	*
3683	Morongo-Bluecut association, 2 to 8 percent slopes-----	3,024	0.4
3684	Morongo loamy sand, 4 to 8 percent slopes, warm-----	2,593	0.3
3685	Morongo-Desertqueen complex, 8 to 30 percent slopes-----	1,322	0.2
3690	Nasagold gravelly loamy sand, 2 to 4 percent slopes-----	3,791	0.5
3695	Gocougs loamy coarse sand, 2 to 8 percent slopes-----	2,138	0.3
4031	Crosgrain-Crackerjack-Pinkcan complex, 4 to 30 percent slopes-----	446	*
4041	Silvermine-Helendale-Burntshack association, 1 to 15 percent slopes-----	420	*
4064	Gravesumit-Helendale complex, 1 to 4 percent slopes-----	842	0.1
4071	Helendale-Desertqueen association, 4 to 15 percent slopes-----	1,127	0.1
4091	Littlefargo-Rock outcrop association, 4 to 15 percent slopes-----	1,587	0.2
4245	Bluecut-Morongo-Yander association, 2 to 8 percent slopes-----	9,668	1.2
4260	Minhoyt-Corbilt association, 2 to 8 percent slopes-----	3,553	0.5
4265	Werewolf gravelly sandy loam, 4 to 15 percent slopes-----	146	*
4270	Yuccabutte very gravelly loam, 8 to 50 percent slopes-----	1,451	0.2
4271	Yuccabutte-Arizo association, 2 to 15 percent slopes-----	3,330	0.4
4275	Pinkcan-Werewolf-Gocougs association, 2 to 8 percent slopes-----	7,554	1.0
4280	Mekkadale-Edalph association, 4 to 30 percent slopes-----	206	*
4285	Typic Argidurids-Coppermine-Minhoyt complex, 4 to 30 percent slopes----	233	*
4403	Arizo complex, 2 to 8 percent slopes-----	821	0.1

See footnote at end of table.

# Soil Survey of Joshua Tree National Park, California

Table 2.-Acreage and Proportionate Extent of the Soils-Continued

Map symbol	Soil name	Acres	Percent
4440	Dragonwash association, 2 to 4 percent slopes-----	1,363	0.2
4450	Morongo association, 2 to 4 percent slopes-----	303	*
4605	Pinecity loamy sand, 2 to 8 percent slopes-----	10,747	1.4
4606	Pinecity-Rock outcrop association, 4 to 15 percent slopes-----	3,867	0.5
4607	Pinecity sand, 4 to 8 percent slopes-----	1,877	0.2
4608	Pinecity-Rock outcrop association, 4 to 15 percent slopes, high elevation	1,938	0.2
4610	Desertqueen-Jumborox-Rock outcrop association, 2 to 8 percent slopes, warm-----	5,939	0.8
4615	Desertqueen-Jumborox-Rock outcrop association, 2 to 15 percent slopes----	2,731	0.3
4620	Stranger-Rock outcrop-Grubstake complex, 8 to 50 percent slopes-----	2,401	0.3
4625	Grinder-Pinkcan complex, 4 to 30 percent slopes-----	1,689	0.2
4630	Thunderclap-Smithcanyon complex, 4 to 15 percent slopes-----	872	0.1
4804	Rock outcrop-Ironped-Pinecity association, 30 to 60 percent slopes-----	9,178	1.2
4805	Rock outcrop-Ironped association, 8 to 15 percent slopes-----	1,007	0.1
4806	Rock outcrop-----	8,616	1.1
4811	Rock outcrop-Pioneertown association, 30 to 60 percent slopes, dry-----	2,368	0.3
4825	Rock outcrop-Grubstake-Cajon-Stranger association, 2 to 15 percent slopes	3,398	0.4
4830	Rock outcrop-Pinecity complex, 8 to 30 percent slopes-----	3,106	0.4
4900	Rock outcrop-Aguilareal-Lostpalms complex, 8 to 50 percent slopes-----	9,215	1.2
	Total-----	780,515	100.0

\* Less than 0.1 percent.

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site

(Miscellaneous nonsoil components are not displayed in this report. Component percents may not add up to 100. MAP is mean annual precipitation)

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
1220: Jadestorm-----	60	15-50	1854-3701	3-5	Mountains	Mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Hyperthermic Steep South Slopes, R030XD003CA
Blackeagle, cool---	20	15-50	1854-3986	3-5	Mountains	Mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Low-Production Hyperthermic Hills, R030XD004CA
1225: Blackeagle-----	65	15-75	1509-3986	3-5	Mountains	Mountain	Colluvium over residuum derived from gneiss	Hyperthermic Steep South Slopes, R030XD003CA
1230: Jadestorm-----	45	30-75	1493-2493	3-5	Hills	Hill	Colluvium derived from granitoid over residuum weathered from granitoid	Hyperthermic Steep South Slopes, R030XD003CA
Jadestorm, cool----	20	30-75	1280-3281	3-5	Hills	Hill	Colluvium and/or residuum derived from granitoid rock	Hyperthermic Dry Hills, R030XD001CA
1240: Meccapass-----	45	30-75	1411-3773	3-5	Mountains	Mountain	Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss	Hyperthermic Steep South Slopes, R030XD003CA
Bulletproof-----	20	30-75	1722-3701	3-5	Mountains	Mountain	Colluvium derived from granitoid over residuum weathered from granitoid	Hyperthermic Steep North Slopes, R030XD040CA

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	<u>Pct</u>	<u>Pct</u>	<u>Ft</u>	<u>In</u>				
1241: Meccapass-----	45	15-75	2362-3281	3-5	Mountains	South-facing side slopes of mountain	Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss	Hyperthermic Steep South Slopes, R030XD003CA
Seanna-----	20	15-75	2625-4331	4-7	Mountains	North-facing side slopes of mountain	Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss	Limy Hill 5-7" p.z., R030XB140CA
Contactmine, dry---	20	15-75	2500-4003	4-7	Mountains	North-facing side slopes of mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Limy Hill 5-7" p.z., R030XB140CA
1242: Meccapass-----	40	15-75	1444-3248	3-5	Mountains	Mountain	Colluvium derived from granodiorite over residuum weathered from granodiorite	Hyperthermic Steep South Slopes, R030XD003CA
Jadestorm-----	25	15-75	1444-3701	3-5	Mountains	Mountain	Colluvium derived from granitoid and/or residuum weathered from granitoid	Hyperthermic Steep South Slopes, R030XD003CA
1250: Ironlung-----	50	30-75	1148-3445	3-5	Mountains	South-facing side slopes of mountain	Colluvium derived from gneiss and/or colluvium derived from granitoid and/or residuum weathered from granitoid and/or residuum weathered from gneiss	Hyperthermic Steep South Slopes, R030XD003CA

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
1250: Ironlung, cool-----	20	30-75	1148-2598	3-5	Mountains	North-facing side slopes of mountain	Colluvium derived from gneiss and/or colluvium derived from granitoid and/or residuum weathered from granitoid and/or residuum weathered from gneiss	Hyperthermic Steep North Slopes, R030XD040CA
1255: Goldenhills-----	40	30-75	394-3281	3-5	Mountains	South-facing side slopes of mountain at elevations below 1000 m	Colluvium derived from granitoid over residuum weathered from granitoid	Hyperthermic Steep South Slopes, R030XD003CA
Bulletproof-----	15	30-75	394-3281	3-5	Mountains	Mountain	Colluvium derived from granitoid over residuum weathered from granitoid	Hyperthermic Steep North Slopes, R030XD040CA
Fanhill-----	15	30-75	394-3281	3-5	Mountains	North- and west-facing side slopes of mountain	Colluvium derived from granitoid over residuum weathered from granitoid	Hyperthermic Steep South Slopes, R030XD003CA
Whiterobe-----	15	30-75	394-3281	3-5	Mountains	South-facing side slopes of mountain	Colluvium derived from granitoid over residuum weathered from granitoid	Hyperthermic Steep South Slopes, R030XD003CA
1260: Whiterobe-----	45	30-75	1968-3445	3-5	Mountains	South-facing side slopes of mountain	Colluvium derived from gneiss and/or from granitoid over residuum weathered from granitoid and/or from gneiss	Hyperthermic Steep South Slopes, R030XD003CA



Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
1260: Bigbernie-----	20	30-75	3445-4593	4-7	Mountains	North-facing side slopes of mountain	Colluvium derived from gneiss and/or granitoid over residuum weathered from granitoid and/or from gneiss	Moderately Deep Gravelly Mountain Slopes, R030XB213CA
Whiterobe, cool----	15	30-75	1968-3445	3-5	Mountains	Low-elevation, north-facing side slopes of mountain	Colluvium derived from gneiss and/or granitoid over residuum weathered from granitoid and/or from gneiss	Hyperthermic Steep North Slopes, R030XD040CA
1410: Missionwell-----	50	15-50	984-2198	3-5	Basalt hills	Basalt hill and basalt lava flow	Colluvium derived from basalt over residuum weathered from basalt	Hyperthermic Steep South Slopes, R030XD003CA
Missionwell, high elevation-----	15	15-50	984-2198	3-5	Basalt hills	Basalt hill and basalt lava flow	Colluvium derived from basalt over residuum weathered from basalt	Hyperthermic Dry Hills, R030XD001CA
1415: Bolero-----	60	30-75	1558-3117	3-5	Mountains	Mountain	Colluvium derived from granitoid and/or gneiss over residuum weathered from granitoid and/or gneiss	Hyperthermic Dry Hills, R030XD001CA
1504: Rizzo, rarely flooded, stony----	50	4-15	1132-2887	2-4	Fan piedmont	Alluvial fan	Alluvium derived from granite and gneiss	Cobbly Fan Remnants, R031XY201CA
Rizzo, occasionally flooded, stony----	35	4-15	1132-2887	2-4	Fan piedmont	Inset fan	Alluvium derived from granite and gneiss	Stony, Occasionally Flooded Ephemeral Stream, R031XY202CA

Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
1510: Carizzo, very gravelly sandy loam-----	85	2-4	1148-2625	3-5	Fan piedmont	Alluvial fan and fan apron	Alluvium derived from granitoid and/or alluvium derived from gneiss	Hyperthermic Fans, R030XD015CA
1511: Carrizo, channeled-	75	2-8	1739-3281	3-5	Fan piedmont	Alluvial fan and fan apron	Alluvium derived from granitoid and/or alluvium derived from gneiss	Flooded Gravelly Fans, R030XY038CA
Carizzo, occasionally flooded-----	15	2-8	1739-3281	3-5	Fan piedmont	Drainageway on alluvial fan and drainageway on fan apron	Alluvium derived from granitoid and/or alluvium derived from gneiss	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream, R030XY001CA
1512: Carizzo, extremely gravelly sandy loam-----	80	2-8	1394-2395	3-5	Fan piedmont	Alluvial fan and fan apron	Alluvium derived from granitoid and/or alluvium derived from gneiss	Hyperthermic Fans, R030XD015CA
1513: Carrizo-----	60	1-4	1181-2625	3-5	Fan piedmont	Alluvial fan	Alluvium derived from granitoid and/or alluvium derived from gneiss	Dry Deep Sandy Fan Aprons, R030XD006CA
Carizzo, occasionally flooded, channeled	20	1-4	1181-2625	3-5	Fan piedmont	Drainageway	Alluvium derived from granitoid and/or alluvium derived from gneiss	Mid Size Thermic To Hyperthermic Ephemeral Stream, R030XY186CA
Rubylee-----	15	1-4	1181-2625	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or alluvium derived from gneiss	Desert Patina, R030XY002CA

# Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
1514: Carrizo, rarely flooded-----	40	0-2	1165-1493	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid and/or alluvium derived from gneiss	Hyperthermic Fans, R030XD015CA
Pintobasin, fine sandy loam-----	30	0-2	1165-1526	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid and/or alluvium derived from gneiss	Dry Deep Sandy Fan Aprons, R030XD006CA
Rubylee-----	15	1-4	1148-1526	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or alluvium derived from gneiss	Desert Patina, R030XY002CA
1515: Pintobasin-----	80	2-8	1286-2598	3-5	Fan piedmont	Alluvial fan	Alluvium derived from granitoid and/or alluvium derived from gneiss	Dry Deep Sandy Fan Aprons, R030XD006CA
Carizzo, occasionally flooded-----	15	2-8	1286-2598	3-5	Fan piedmont	Drainageway	Alluvium derived from granitoid and/or alluvium derived from gneiss	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream, R030XY001CA
1516: Pintobasin, fine sandy loam-----	90	0-2	1066-1247	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Dry Deep Sandy Fan Aprons, R030XD006CA
1517: Pintobasin-----	65	2-8	1047-2244	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid with eolian influence	Dry Deep Sandy Fan Aprons, R030XD006CA
Dalelake-----	25	2-8	1047-2244	3-5	Fan piedmont	Sand sheet	Eolian deposits derived from igneous rock	Hyperthermic Sandsheets, R030XD025CA

Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
1520: Pintobasin, loamy sand-----	80	2-8	1033-2313	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA
1522: Pintobasin, rarely flooded-----	85	1-3	1083-2395	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA
1523: Pintobasin, rarely flooded-----	50	2-4	1795-2264	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA
Aquapeak-----	25	2-4	1608-2395	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Desert Patina, R030XY002CA
Pintobasin, occasionally flooded-----	20	2-4	1394-2395	3-5	Fan piedmont	Inset fan	Alluvium derived from granitoid	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream, R030XY001CA
1524: Pintobasin, rarely flooded-----	90	0-2	1657-1903	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA
1525: Pintobasin, occasionally flooded-----	45	2-4	1526-2592	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream, R030XY001CA
Pintobasin, rarely flooded-----	35	2-4	1526-2592	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA
1526: Pintobasin, rarely flooded-----	55	2-8	968-2805	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA

Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
1526: Joetree-----	20	2-8	656-2625	3-5	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA
Patscamp-----	15	2-8	656-2625	3-5	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA
1527: Pintobasin, moist--	90	4-15	1378-2461	3-5	Fan piedmont	Alluvial fan	Alluvium derived from gneiss and/or alluvium derived from granitoid	Coarse Gravelly Fans, R030XD039CA
1530: Dalelake, fine sand	85	0-4	1017-1280	3-5	Fan piedmont	Sand sheet	Eolian deposits derived from granitoid	Hyperthermic Sandsheets, R030XD025CA
1531: Dalelake-----	60	2-4	1640-1804	3-5	Fan piedmont	Sand sheet	Eolian sands derived from granitoid	Hyperthermic Sandsheets, R030XD025CA
Pintobasin, rarely flooded-----	30	0-2	1575-1919	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA
1540: Carrizo, very rarely flooded----	35	2-8	564-1486	3-5	Fan piedmont	Fan remnant	Alluvium derived from igneous and metamorphic rock	Coarse Gravelly Fans, R030XD039CA
Carrizo, stable----	25	4-8	574-1804	3-5	Fan piedmont	Fan apron	Alluvium derived from igneous and metamorphic rock	Desert Patina, R030XY002CA
Carrizo, occasionally flooded, rocky surface-----	20	2-8	574-1804	3-5	Fan piedmont	Inset fan	Alluvium derived from igneous and metamorphic rock	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream, R030XY021CA
Russiroks-----	20	2-4	574-1493	3-5	Fan piedmont	Fan remnant	Alluvium derived from igneous and metamorphic rock	Desert Patina, R030XY002CA



Soil Survey of Joshua Tree National Park, California

Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit		Slope	Elevation		MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct		Ft	In					
1541: Carrizo, stable----	50	4-15		525-755	3-5	Fan piedmont	Fan apron		Alluvium derived from igneous and metamorphic rock	Desert Patina, R030XY002CA
Cambidic Haplodurids-----	40	4-15		525-755	3-5	Fan piedmont	Fan remnant		Alluvium derived from igneous and metamorphic rock	Hyperthermic Shallow Fan Remnants, R030XD042CA
1542: Carrizo, very rarely flooded----	70	4-15		1476-3051	3-5	Fan piedmont	Fan apron and fan remnant		Alluvium derived from granitoid and/or alluvium derived from gneiss	Coarse Gravelly Fans, R030XD039CA
Carrizo, occasionally flooded-----	20	4-8		1476-3051	3-5	Fan piedmont	Inset fan		Alluvium derived from granitoid and/or alluvium derived from gneiss	Broad, Gravelly, Hyperthermic Ephemeral Stream, R030XY128CA
1550: Buzzardsprings, stable-----	35	2-4		951-1575	3-5	Fan piedmont	Fan remnant		Alluvium derived from igneous rock	Desert Patina, R030XY002CA
Coxpin-----	25	2-8		951-1575	3-5	Fan piedmont	Flat fan remnant		Alluvium derived from igneous rock	Hyperthermic Shallow Fan Remnants, R030XD042CA
Dalelake-----	20	2-8		951-1575	3-5	Fan piedmont	Sand sheet		Eolian deposits derived from igneous rock	Hyperthermic Sandsheets, R030XD025CA
1555: Goldrose-----	35	4-8		1273-2739	2-4	Fan piedmont	Alluvial fan		Alluvium derived from granitoid and/or alluvium derived from gneiss	Rarely Flooded Fans, R031XY200CA
Carsitas, very rarely flooded----	30	4-8		1230-2625	2-4	Fan piedmont	Fan apron		Alluvium derived from granitoid and/or alluvium derived from gneiss	Rarely Flooded Fans, R031XY200CA

Soil Survey of Joshua Tree National Park, California

Table 3.--Climate, Landscape, Landform, Parent Material, and Ecological Site--Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	<u>Pct</u>	<u>Pct</u>	<u>Ft</u>	<u>In</u>				
1555: Chemwash, rarely flooded-----	25	4-8	1263-2739	2-4	Fan piedmont	Fan apron	Alluvium derived from granitoid and/or alluvium derived from gneiss	Gravelly, Braided, Ephemeral Stream, R031XY034CA
2003: Emptygun-----	100	15-50	1640-2034	2-4	Fan piedmont	Ballena	Alluvium derived from granitoid and/or alluvium derived from gneiss	Steep South Slope 2-4" p.z., R031XY003CA
2060: Joetree, very rarely flooded----	35	0-2	1115-1608	3-5	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	Dry Deep Sandy Fan Aprons, R030XD006CA
Dalelake-----	30	0-2	1115-1608	3-5	Fan piedmont	Sand sheet	Eolian deposits derived from granitoid	Hyperthermic Sandsheets, R030XD025CA
Pintobasin, fine sandy loam-----	25	0-2	1115-1608	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Dry Deep Sandy Fan Aprons, R030XD006CA
2065: Dalelake-----	30	2-4	1503-2461	3-5	Fan piedmont	Sand sheet	Eolian deposits derived from granitoid	Hyperthermic Sandsheets, R030XD025CA
Aquapeak-----	25	2-8	1503-2461	3-5	Fan piedmont	Fan remnant	Alluvium derived from igneous rock	Desert Patina, R030XY002CA
Coxpin-----	25	2-8	1503-2461	3-5	Fan piedmont	Fan remnant	Alluvium derived from igneous rock	Hyperthermic Shallow Fan Remnants, R030XD042CA
2067: Aquapeak, overblown	30	2-15	1690-2100	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Hyperthermic Shallow Fan Remnants, R030XD042CA
Buzzardsprings-----	25	2-15	1608-2395	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Hyperthermic Fans, R030XD015CA

Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
2067: Dalelake, thick sandy surface-----	20	2-15	1640-1804	3-5	Fan piedmont	Sand sheet	Eolian sands derived from granitoid and/or from gneiss	Hyperthermic Sandy Plains, R030XD014CA
Buzzardsprings, steep-----	15	15-30	1608-2395	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Hyperthermic Dry Hills, R030XD001CA
2068: Aquapeak-----	45	0-4	1558-2346	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Desert Patina, R030XY002CA
Carpetflat, nongravelly surface-----	35	0-4	1558-2346	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Hyperthermic Shallow Fan Remnants, R030XD042CA
Pintobasin-----	15	0-4	1558-2346	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	Dry Deep Sandy Fan Aprons, R030XD006CA
2070: Missionsweet-----	60	8-30	1542-2543	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Low-Production Hyperthermic Hills, R030XD004CA
Carpetflat-----	25	2-4	1542-2543	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Desert Patina, R030XY002CA
2075: Oldale-----	50	0-4	1722-2329	3-5	Fan piedmont	Fan remnant	Eolian deposits over alluvium derived from igneous rock	Desert Patina, R030XY002CA
Missionsweet-----	30	8-15	1722-2329	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Low-Production Hyperthermic Hills, R030XD004CA
2076: Oldale-----	40	2-8	1230-2625	3-5	Fan piedmont	Fan remnant	Eolian deposits over alluvium derived from igneous rock	Desert Patina, R030XY002CA

Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit		Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct							
2076: Carrizo-----	30	2-8		1394-2395	3-5	Fan piedmont	Alluvial fan	Alluvium derived from mixed sources	Dry Deep Sandy Fan Aprons, R030XD006CA
2077: Oldale-----	50	0-8		656-1296	3-5	Fan piedmont	Fan remnant	Eolian deposits over alluvium derived from igneous rock	Desert Patina, R030XY002CA
Carrizo-----	25	2-4		666-1296	3-5	Fan piedmont	Fan apron	Alluvium derived from mixed sources	Dry Deep Sandy Fan Aprons, R030XD006CA
Carrizo, very rarely flooded----	15	2-8		666-1289	3-5	Fan piedmont	Alluvial fan	Alluvium derived from mixed sources	Coarse Gravelly Fans, R030XD039CA
2085: Rainbowsend-----	45	8-50		1690-2625	3-5	Fan piedmont	Fan remnant	Alluvium derived from igneous rock	Hyperthermic Steep South Slopes, R030XD003CA
Goldenbell-----	35	4-15		1690-2789	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or alluvium derived from gneiss	Desert Patina, R030XY002CA
2090: Deprave-----	35	2-4		1115-1722	2-4	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or gneiss	Desert Pavement 2-4" p.z., R031XY002CA
Rockhound-----	25	2-8		1050-1722	2-4	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or gneiss	Desert Pavement 2-4" p.z., R031XY002CA
Rizzo-----	20	2-8		984-1722	2-4	Fan piedmont	Fan apron	Alluvium derived from granitoid and/or gneiss	Gravelly Fan Remnants And Fan Aprons, R031XY009CA
2091: Deprave-----	60	0-2		525-738	2-4	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or alluvium derived from gneiss	Desert Pavement 2-4" p.z., R031XY002CA

Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
2091:								
Roostertail-----	15	0-4	492-673	2-4	Fan piedmont	Fan apron and lower fan remnant	Eolian deposits derived from granitoid and metamorphic rock over alluvium derived from granitoid and metamorphic rock	Limy 2-4" p.z., R031XY006CA
2100:								
Perurose-----	50	2-15	951-2559	3-5	Fan piedmont	Fan remnant	Alluvium derived from gneiss and/or alluvium derived from granitoid	Hyperthermic Shallow Fan Remnants, R030XD042CA
Coxpin-----	25	2-8	951-2559	3-5	Fan piedmont	Fan apron on fan remnant	Alluvium derived from gneiss and/or alluvium derived from granitoid	Hyperthermic Shallow Fan Remnants, R030XD042CA
Pintobasin, gravelly surface--	15	2-15	951-2559	3-5	Fan piedmont	Fan apron on fan remnant	Alluvium derived from gneiss and/or alluvium derived from granitoid	Hyperthermic Shallow Fan Remnants, R030XD042CA
2101:								
Perurose, rarely flooded-----	60	2-8	958-1496	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or alluvium derived from gneiss	Hyperthermic Fans, R030XD015CA
Pintobasin, rarely flooded-----	35	2-4	958-1496	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid and/or alluvium derived from gneiss	Hyperthermic Fans, R030XD015CA
2110:								
Descent-----	80	8-50	591-1197	3-5	Fan piedmont	Ballena	Alluvium derived from granitoid and/or from gneiss	Low-Production Hyperthermic Hills, R030XD004CA
Descent, stable----	15	4-8	591-1197	3-5	Fan piedmont	Ballena	Alluvium derived from granitoid and/or from gneiss	Desert Patina, R030XY002CA



Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
2111: Descent, warm-----	45	15-50	1575-2165	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or from gneiss	Hyperthermic Steep South Slopes, R030XD003CA
Rubylee, very rarely flooded----	40	8-15	1804-2165	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or from gneiss	Coarse Gravelly Fans, R030XD039CA
2120: Rizzo, rarely flooded-----	35	2-8	541-1066	2-4	Fan piedmont	Drainage way	Alluvium derived from granitoid and/or alluvium derived from gneiss	Rarely Flooded Fans, R031XY200CA
Deprave-----	35	2-4	541-1066	2-4	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or alluvium derived from gneiss	Desert Pavement 2-4" p.z., R031XY002CA
Rizzo, frequently flooded-----	20	2-4	541-1066	2-4	Fan piedmont	Channel	Alluvium derived from granitoid and/or alluvium derived from gneiss	Frequently Flooded, Confined Ephemeral Stream, R031XY029CA
2121: Rizzo, rubbly-----	90	4-15	1837-2625	2-4	Fan piedmont	Alluvial fan	Alluvium derived from granitoid	Extremely Stony Fan Remnants, R031XY030CA
2130: Goldenbell-----	55	2-4	574-951	3-5	Fan piedmont	Broad fan remnant	Alluvium derived from granitoid and/or alluvium derived from gneiss	Desert Patina, R030XY002CA
Descent-----	40	4-15	591-902	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or from gneiss	Low-Production Hyperthermic Hills, R030XD004CA

Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope		Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
		Pct	Pct						
				Ft	In				
2140: Rockhound, cobbly--	85	4-15		1772-2018	2-4	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or alluvium derived from gneiss	Cobbly Fan Remnants, R031XY201CA
2402: Rizzo-----	70	2-8		541-1690	2-4	Fan piedmont	Fan apron	Alluvium derived from igneous rock	Gravelly Fan Remnants And Fan Aprons, R031XY009CA
Rizzo, frequently flooded-----	20	2-8		541-1690	2-4	Fan piedmont	Drainageway	Alluvium derived from igneous rock	Large, High Intensity, Frequently Flooded Ephemeral Stream, R031XY026CA
2403: Rizzo-----	80	4-8		541-2625	2-4	Fan piedmont	Broad, flat fan remnant	Alluvium derived from igneous rock	Gravelly Fan Remnants And Fan Aprons, R031XY009CA
Rizzo, occasionally flooded-----	15	2-8		541-2625	2-4	Fan piedmont	Incised drainageway	Alluvium derived from igneous rock	Coarse Gravelly Wash, R031XY019CA
2404: Rizzo, occasionally flooded-----	60	2-8		984-2690	2-4	Fan piedmont	Drainageway	Alluvium derived from igneous and metamorphic rock	Gravelly, Braided, Ephemeral Stream, R031XY034CA
Rizzo, very rarely flooded-----	35	2-8		984-2690	2-4	Fan piedmont	Inset fan	Alluvium derived from igneous and metamorphic rock	Gravelly, Braided, Ephemeral Stream, R031XY034CA
2405: Carrizo, rarely flooded-----	65	0-4		1394-2428	3-5	Fan piedmont	Inset fan	Alluvium derived from granitoid and/or alluvium derived from gneiss	Hyperthermic Fans, R030XD015CA

Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
2405: Carrizo, occasionally flooded-----	25	0-4	1394-2428	3-5	Fan piedmont	Drainageway	Alluvium derived from granitoid and/or alluvium derived from gneiss	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Epheermal Stream, R030XY010CA
2406: Pintobasin, frequently flooded	50	2-8	1394-2395	3-5	Fan piedmont	Active channel	Alluvium derived from granitoid	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Epheermal Stream, R030XY010CA
Carrizo, occasionally flooded-----	40	2-8	1394-2395	3-5	Fan piedmont	Drainageway	Alluvium derived from granitoid	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Epheermal Stream, R030XY010CA
2407: Pintobasin, rarely flooded-----	45	2-4	2116-2461	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid and/or alluvium derived from gneiss	Hyperthermic Fans, R030XD015CA
Carrizo, occasionally flooded-----	30	2-4	2116-2493	3-5	Fan piedmont	Inset fan	Alluvium derived from granitoid and/or alluvium derived from gneiss	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Epheermal Stream, R030XY010CA
Carrizo, frequently flooded	20	2-4	2116-2493	3-5	Fan piedmont	Channel	Alluvium derived from granitoid and/or alluvium derived from gneiss	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Epheermal Stream, R030XY010CA

Table 3.--Climate, Landscape, Landform, Parent Material, and Ecological Site--Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
2408: Rizzo, frequently flooded-----	55	2-8	1165-2346	2-4	Fan piedmont	Channel	Alluvium derived from igneous rock	Large, High Intensity, Frequently Flooded Ephemeral Stream, R031XY026CA
Rizzo, very rarely flooded-----	35	2-8	1165-2346	2-4	Fan piedmont	Inset fan	Alluvium derived from igneous rock	Large, High Intensity, Frequently Flooded Ephemeral Stream, R031XY026CA
2409: Rizzo, frequently flooded-----	35	4-8	1033-2625	2-4	Fan piedmont	Channel	Alluvium derived from granitoid and/or alluvium derived from gneiss	Large, High Intensity, Frequently Flooded Ephemeral Stream, R031XY026CA
Chemwash, frequently flooded	30	4-8	1033-2657	2-4	Fan piedmont	Channel	Alluvium derived from granitoid and/or alluvium derived from gneiss	Large, High Intensity, Frequently Flooded Ephemeral Stream, R031XY026CA
Carsitas, occasionally flooded, braided--	25	4-8	1033-2625	2-4	Fan piedmont	Braided drainageway	Alluvium derived from granitoid and/or alluvium derived from gneiss	Gravelly, Braided, Ephemeral Stream, R031XY034CA
2420: Carsitas, frequently flooded	45	0-4	902-1739	2-4	Fan piedmont	Channel	Alluvium derived from granitoid and/or alluvium derived from gneiss	Valley Wash, R031XY010CA
Carsitas, occasionally flooded-----	40	0-4	902-1739	2-4	Fan piedmont	Drainageway	Alluvium derived from granitoid and/or alluvium derived from gneiss	Valley Wash, R031XY010CA

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	<u>Pct</u>	<u>Pct</u>	<u>Ft</u>	<u>In</u>				
2420: Carsitas, rarely flooded-----	15	0-4	902-1739	2-4	Fan piedmont	Bar	Alluvium derived from granitoid and/or alluvium derived from gneiss	Coarse Gravelly Wash, R031XY019CA
2421: Carsitas, very rarely flooded----	55	4-8	1476-2625	2-4	Fan piedmont	Alluvial fan	Alluvium derived from granitoid and/or alluvium derived from gneiss	Rarely Flooded Fans, R031XY200CA
Carsitas, rarely flooded-----	25	4-8	1476-2625	2-4	Fan piedmont	Bar	Alluvium derived from granitoid and/or alluvium derived from gneiss	Gravelly, Braided, Ephemeral Stream, R031XY034CA
2431: Chemwash, frequently flooded, braided--	60	4-8	1804-2657	2-4	Fan piedmont	Drainageway	Alluvium derived from granitoid and/or alluvium derived from gneiss	Gravelly, Braided, Ephemeral Stream, R031XY034CA
Chemwash, frequently flooded	25	4-8	1804-2657	2-4	Fan piedmont	Drainageway on upper alluvial fan	Alluvium derived from granitoid and/or alluvium derived from gneiss	Large, High Intensity, Frequently Flooded Ephemeral Stream, R031XY026CA
2440: Rizzo-----	35	8-15	1230-2231	2-4	Fan piedmont	Fan apron	Alluvium derived from igneous rock	Gravelly Fan Remnants And Fan Aprons, R031XY009CA
Rizzo, occasionally flooded-----	30	8-15	1230-2231	2-4	Fan piedmont	Braided drainageway	Alluvium derived from igneous rock	Gravelly, Braided, Ephemeral Stream, R031XY034CA
Rizzo, extremely stony-----	15	8-15	1230-2231	2-4	Fan piedmont	Fan remnant	Alluvium derived from igneous rock	Extremely Stony Fan Remnants, R031XY030CA



Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
2715: Dalelake-----	35	2-8	1148-1968	3-5	Fan piedmont	Dune and sand sheet	Eolian sands derived from granitoid	Hyperthermic Sandsheets, R030XD025CA
Sheephole-----	30	2-4	1148-2198	3-5	Fan piedmont	Sand sheet	Eolian deposits derived from granitoid over alluvium derived from granitoid	Hyperthermic Sandy Plains, R030XD014CA
Pintobasin-----	25	2-4	1148-1968	3-5	Fan piedmont	Fan apron	Alluvium and eolian sands derived from mixed sources	Dry Deep Sandy Fan Aprons, R030XD006CA
2716: Dalelake, steep----	75	8-30	1690-1985	3-5	Fan piedmont	Dune	Eolian sands derived from mixed sources	Hyperthermic Sandhill, R030XD008CA
Dalelake-----	20	4-8	1690-1985	3-5	Fan piedmont	Sand sheet	Eolian sands derived from mixed sources	Hyperthermic Sandsheets, R030XD025CA
2717: Dalelake-----	40	8-30	951-1542	3-5	Basalt hills	Sand sheet on lava flow	Eolian deposits derived from igneous rock	Hyperthermic Sandhill, R030XD008CA
Buzzardsprings, fine sand-----	20	4-30	951-1542	3-5	Hills	Fan remnant	Alluvium derived from igneous rock	Hyperthermic Shallow Fan Remnants, R030XD042CA
2718: Dalelake-----	55	2-4	705-876	3-5	Fan piedmont	Sand sheet	Eolian deposits derived from igneous rock	Hyperthermic Sandsheets, R030XD025CA
Sheephole, gravelly surface--	45	2-4	853-902	3-5	Fan piedmont	Sand sheet on fan apron	Eolian deposits derived from igneous rock over alluvium derived from igneous rock	Hyperthermic Sandsheets, R030XD025CA

Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
2820: Impedimenta-----	25	4-30	1722-2756	3-5	Fan piedmont	Pediment	Residuum weathered from granitoid	Hyperthermic Dissected Shallow Pediment, R030XD023CA
2825: Supplymine-----	25	30-60	1148-2789	3-5	Mountains	North-facing mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Low-Production Hyperthermic Hills, R030XD004CA
Bolero, dry-----	15	15-60	1558-2789	3-5	Hills and mountain	Hill and mountain	None assigned	Low-Production Hyperthermic Hills, R030XD004CA
Ironage-----	15	15-60	1148-2789	3-5	Mountains	Mountain	Residuum weathered from gneiss	Low-Production Hyperthermic Hills, R030XD004CA
2830: Blackeagle, cool---	10	30-75	525-3986	3-5	Mountains	Mountain	Colluvium over residuum derived from granitoid	Low-Production Hyperthermic Hills, R030XD004CA
2835: Blackeagle-----	40	30-75	1115-3953	3-5	Mountains	Mountain	Colluvium over residuum derived from granitoid	Hyperthermic Steep South Slopes, R030XD003CA
2840: Jadestorm-----	30	30-60	1394-3701	3-5	Mountains	Mountain	Colluvium derived from granitoid and/or gneiss over residuum weathered from granitoid and/or gneiss	Hyperthermic Steep South Slopes, R030XD003CA
3110: Coppermine, cool---	40	15-50	2739-3330	4-7	Hills	Hill	Colluvium derived from granitoid and/or residuum weathered from granitoid	Limy Hill 5-7" p.z., R030XB140CA
Stranger-----	30	8-50	2739-3330	4-7	Fan piedmont	Pediment	Residuum weathered from granitoid	Warm Sloping Pediments, R030XB225CA

Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
Pct	Pct	Ft	In					
3120: Aguilareal-----	40	30-60	2762-3937	4-7	Mountains	Side slopes of mountain	Colluvium derived from granite over residium weathered from granite	Warm Gravelly Shallow Hills, R030XB172CA
Blackeagle-----	20	30-60	2756-3707	3-5	Mountains	South-facing, low-elevation side slopes of mountain	Colluvium over residium derived from granitoid	Hyperthermic Steep South Slopes, R030XD003CA
3213: Dalvord-----	35	15-60	2848-3757	4-7	Hills	Side slopes of hill	Colluvium derived from gneiss and/or residium weathered from gneiss	Limy Hill 3-5" P.Z., R030XB139CA
Aguilareal-----	30	30-60	2848-3757	4-7	Hills	Side slopes of hill	Colluvium derived from granite over residium weathered from granite	Warm Gravelly Shallow Hills, R030XB172CA
3242: Langwell-----	50	4-30	3202-3674	4-7	Upper fan piedmont	Pediment	Colluvium derived from granitoid over residuum weathered from granitoid	Warm Sloping Pediments, R030XB225CA
Helendale, cool----	20	4-8	3199-3937	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	Moderately Deep To Very Deep Loamy Fan Remnants, R030XB218CA
3285: Pinecity-----	30	30-50	3363-5003	4-7	Hills	Hill	Colluvium and residium derived from/weathered from granite	Shallow Sandy Cool Hills, R030XB189CA
Contactmine-----	20	15-50	3363-4728	4-7	Hills	Hill	Colluvium derived from granite over residium weathered from granite	Shallow Sandy Cool Hills, R030XB189CA
Desertqueen-----	20	15-50	3363-5003	4-7	Hills	Hill	Colluvium derived from granite over residium weathered from granite	Shallow Sandy Cool Hills, R030XB189CA

Soil Survey of Joshua Tree National Park, California

Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
3286: Pinecity, gravelly loamy sand-----	85	30-60	3806-5709	4-7	Mountains	Hill and mountain	Colluvium derived from granitoid over residuum weathered from granitoid	Shallow Sandy Cool Hills, R030XB189CA
3291: Smithcanyon-----	40	15-50	4265-5577	7-10	Hills	Hill	Colluvium derived from granitoid over residuum weathered from granitoid	Sandy Xeric-Intergrade Slopes, R030XE196CA
Stubbespring-----	25	15-50	4265-5577	7-10	Hills	Hill	Colluvium derived from granitoid over residuum weathered from granitoid	Sandy Xeric-Intergrade Slopes, R030XE196CA
3292: Smithcanyon-----	35	15-50	3609-4921	7-10	Hills and mountains	North-facing hill	Colluvium derived from granitoid over residuum weathered from granitoid	Sandy Xeric-Intergrade Slopes, R030XE196CA
Pinecity-----	25	15-50	3609-4921	4-7	Hills and mountains	South-facing hill	Colluvium derived from granitoid over residuum weathered from granitoid	Shallow Sandy Cool Hills, R030XB189CA
3293: Smithcanyon-----	50	15-50	3609-5200	7-10	Mountains and hills	North-facing hill at elevations below 1585 m	Colluvium derived from granitoid and/or colluvium derived from gneiss over residuum weathered from gneiss and/or residuum weathered from granitoid	Sandy Xeric-Intergrade Slopes, R030XE196CA

Table 3.--Climate, Landscape, Landform, Parent Material, and Ecological Site--Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
3293: Pinecity-----	25	15-50	3609-5200	4-7	Mountains and hills	South-facing hill at elevations below 1585 m	Colluvium derived from granitoid and/or colluvium derived from gneiss over residuum weathered from gneiss and/or residuum weathered from granitoid	Shallow Sandy Cool Hills, R030XB189CA
3294: Smithcanyon, dry---	80	30-75	3445-5741	7-10	Mountains	Mountain	Colluvium derived from granitoid and/or colluvium derived from gneiss over residuum weathered from granitoid and/or residuum weathered from gneiss	Dry Sandy Mountain Slopes, R030XE191CA
3295: Desertqueen, dry---	40	15-50	3150-4823	4-7	Mountains	North-facing mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Very Shallow To Moderately Deep Gravelly Slopes, R030XB193CA
Hexie-----	20	15-50	2297-3937	4-7	Mountains	South-facing mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Very Shallow To Moderately Deep Gravelly Slopes, R030XB193CA
3296: Desertqueen-----	45	15-50	3609-5167	4-7	Mountains	Mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Shallow Sandy Cool Hills, R030XB189CA
Pinecity-----	35	15-50	3609-5495	4-7	Hills	Hill	Colluvium derived from granitoid over residuum weathered from granitoid	Shallow Sandy Cool Hills, R030XB189CA

Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
3297: Desertqueen, warm--	40	4-30	3150-3527	4-7	Hills	Hill	Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss	Limy Hill 5-7" p.z., R030XB140CA
Contactmine, dry---	20	4-30	3002-3527	4-7	Hills	Hill	Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss	Limy Hill 5-7" p.z., R030XB140CA
Seanna, dry-----	20	4-30	3002-3527	5-7	Hills	Hill	Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss	Limy Hill 3-5" P.Z., R030XB139CA
3325: Ironped, warm-----	30	30-60	2297-3937	3-7	Mountains	Mountain	Colluvium derived from granitoid and/or residuum weathered from granitoid	Thermic Steep South Slopes, R030XB164CA
Hexie-----	15	30-60	2625-3937	4-7	Mountains	Mountain	Colluvium derived from granitoid and/or residuum weathered from granitoid	Very Shallow To Moderately Deep Gravelly Slopes, R030XB193CA
Ironped-----	15	30-60	2297-4724	3-7	Mountains	Mountain	Colluvium derived from granitoid and/or residuum weathered from granitoid	Warm Gravelly Shallow Hills, R030XB172CA
3335: Xeric Torriorthents	40	30-75	3609-5495	7-10	Hills	High-elevation, north-facing side slopes of hill	Colluvium and residuum derived from and/or weathered from granitoid	Sandy Xeric-Intergrade Slopes, R030XE196CA



Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	<u>Pct</u>	<u>Pct</u>	<u>Ft</u>	<u>In</u>				
3335: Xeric Torriorthents, warm-----	25	30-75	3609-5495	7-10	Hills	Low-elevation, south-facing side slopes of hill	Colluvium and residuum derived from and/or weathered from granitoid	Dry Sandy Mountain Slopes, R030XE191CA
3336: Xeric Torriorthents	45	30-75	3445-5413	7-10	Mountains	Mountain	Colluvium and residuum derived from and/or weathered from granitoid	Sandy Xeric-Intergrade Slopes, R030XE196CA
Bigbernie-----	25	30-75	3445-4757	4-7	Mountains	Mountain	Colluvium derived from granitoid and/or colluvium derived from gneiss over residuum weathered from granitoid and/or residuum weathered from gneiss	Moderately Deep Gravelly Mountain Slopes, R030XB213CA
3340: Seanna-----	35	30-75	2500-4003	4-7	Mountains	South-facing and/or low- elevation slopes on mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Limy Hill 5-7" p.z., R030XB140CA
Grubstake, moist---	20	30-75	2500-4101	4-7	Mountains	South-facing and low- elevation (below 1200 m) slopes on mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Limy Hill 5-7" p.z., R030XB140CA
Pinecity-----	15	30-75	3510-5446	4-7	Mountains	Mountain	Colluvium derived from gneiss over residuum weathered from gneiss	Shallow Sandy Cool Hills, R030XB189CA

Table 3.--Climate, Landscape, Landform, Parent Material, and Ecological Site--Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	<u>Pct</u>	<u>Pct</u>	<u>Ft</u>	<u>In</u>				
3345: Bigcanyon-----	55	30-75	2625-3701	4-7	Mountains	South-facing side slopes of mountain at elevations between 792 and 1128 m	Colluvium derived from gneiss and/or colluvium derived from granitoid over residuum weathered from granitoid and/or residuum weathered from gneiss	Warm Gravelly Shallow Hills, R030XB172CA
Bigcanyon, cool----	20	30-75	2789-3281	4-7	Mountains	North-facing side slopes of mountain at elevations below 1000 m	Colluvium derived from gneiss and/or colluvium derived from granitoid over residuum weathered from granitoid and/or residuum weathered from gneiss	Moderately Deep Gravelly Mountain Slopes, R030XB213CA
3440: Pacific Mesa, steep	65	15-50	2461-4265	4-7	Mountains	Hill	None assigned	Limy Hill 5-7" p.z., R030XB140CA
Pacific Mesa-----	30	8-15	2461-4265	4-7	Mountains and hills	Hill	None assigned	Limy 5-7" p.z. (Low Production), R030XB156CA
3509: Cajon, very rarely flooded-----	60	2-8	2559-3445	4-7	Fan piedmont	Fan apron	Alluvium derived from granitoid	Moderately Deep To Very Deep Loamy Fan Remnants, R030XB218CA
Friedliver-----	20	2-8	2559-3445	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	Moderately Deep To Very Deep Loamy Fan Remnants, R030XB218CA
3525: Cajon-----	70	2-8	1985-3117	4-7	Fan piedmont	Fan apron	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV
Friedliver-----	15	2-4	2001-3117	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site--Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
3526: Cajon-----	40	1-4	2379-3789	4-7	Fan piedmont	Fan apron	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV
Hypoint-----	35	1-4	2379-3789	4-7	Fan piedmont	Fan apron	Alluvium derived from igneous rock	Gravelly Outwash, R030XY159CA
Arizo, occasionally flooded-----	15	1-4	2608-3789	5-7	Fan piedmont	Drainageway	Alluvium derived from granitoid and/or gneiss	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Epheermal Stream, R030XY010CA
3611: Burntshack, sand surface-----	50	2-4	3396-4052	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	Sandy Fan Aprons, R030XB174CA
Burntshack-----	35	8-15	3396-4052	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	Sandy Fan Aprons, R030XB174CA
3612: Burntshack-----	75	2-4	2789-3527	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV
Burntshack, occasionally flooded-----	20	2-4	2789-3527	4-7	Fan piedmont	Inset fan	Alluvium derived from granitoid	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Epheermal Stream, R030XY010CA
3676: Morongo, loamy sand, very rarely flooded-----	80	2-4	3953-4593	4-7	Fan piedmont	Fan apron	Alluvium derived from granitoid	Sandy Fan Aprons, R030XB174CA
3677: Morongo-----	80	2-4	3297-3806	4-7	Fan piedmont	Fan apron	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV

Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit		Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct		Ft	In				
3679: Morongo, cool-----	55	2-8		3281-5085	4-7	Fan piedmont	Fan apron	Alluvium derived from gneiss and/or alluvium derived from granitoid	Cool Deep Sandy Fans, R030XB168CA
Jumborox-----	20	2-8		3281-5085	4-7	Fan piedmont	Fan remnant	Alluvium derived from gneiss and/or alluvium derived from granitoid	Cool Deep Sandy Fans, R030XB168CA
3680: Morongo-----	85	2-8		2100-3445	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV
3681: Morongo, very rarely flooded----	45	4-8		3510-4281	4-7	Fan piedmont	Fan apron	Alluvium derived from granite and gneiss	Sandy Fan Aprons, R030XB174CA
Jumborox, dry-----	35	4-8		3510-4281	4-7	Fan piedmont	Fan remnant	Alluvium derived from granite and gneiss	Coarse Loamy Very Deep Fan Remnants, R030XB173CA
3682: Morongo, cool-----	50	4-8		3281-4183	4-7	Fan piedmont	Fan apron	Alluvium derived from gneiss and/or alluvium derived from granitoid	Cool Deep Sandy Fans, R030XB168CA
Jumborox-----	15	4-8		3281-4183	4-7	Fan piedmont	Fan remnant	Alluvium derived from gneiss and/or alluvium derived from granitoid	Cool Deep Sandy Fans, R030XB168CA
3683: Morongo-----	55	2-8		2116-3658	3-5	Fan piedmont	Fan apron	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV
Bluecut, very rarely flooded----	30	2-8		2116-3658	3-5	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Very Rarely Flooded, Warm Thermic Fan Piedmonts, R030XB192CA

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
3684: Morongo, warm-----	85	4-8	3281-4183	4-7	Fan piedmont	Fan apron	Alluvium derived from granitoid	Very Rarely Flooded, Warm Thermic Fan Piedmonts, R030XB192CA
3685: Morongo, cool-----	65	8-15	3281-4921	4-7	Fan piedmont	Fan apron	Alluvium derived from gneiss and/or alluvium derived from granitoid	Cool Deep Sandy Fans, R030XB168CA
Desertqueen, undulating-----	15	8-30	3281-4872	4-7	Fan piedmont	Fan remnant on pediment	Colluvium derived from gneiss and/or residium weathered from gneiss	Dissected Pediment, Cool, R030XB166CA
3690: Nasagold-----	85	2-4	4380-4528	4-7	Fan piedmont	Fan apron	Alluvium derived from granite and gneiss	Coarse Loamy Very Deep Fan Remnants, R030XB173CA
3695: Gocougs-----	80	2-8	2936-3592	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	Moderately Deep To Very Deep Loamy Fan Remnants, R030XB218CA
4031: Crosgrain-----	50	8-30	3068-3658	4-7	Fan piedmont	Fan remnant	Alluvium derived from igneous rock	Limy 5-7" p.z. (Low Production), R030XB156CA
Crackerjack-----	30	8-30	3068-3658	4-7	Fan piedmont	Fan remnant	Alluvium derived from igneous rock	Limy Hill 3-5" P.Z., R030XB139CA
Pinkcan, dry-----	15	4-8	3068-3658	4-7	Fan piedmont	Fan remnant	Alluvium derived from igneous rock	Limy 5-7" p.z. (Low Production), R030XB156CA
4041: Silvermine-----	40	8-15	3100-3855	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or gneiss	Limy Hill 5-7" p.z., R030XB140CA
Helendale-----	30	4-8	3117-3855	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV

# Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
4041: Burntshack, very rarely flooded----	20	1-4	3100-3855	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid and/or gneiss	Sandy Plain 3-5" P.Z., R030XB148CA
4064: Gravesumit-----	55	1-4	2969-3133	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from igneous rock	Granitic loam, R030XB137CA
Helendale, sandy surface-----	35	1-4	2969-3133	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Granitic loam, R030XB137CA
4071: Helendale-----	65	4-15	3199-3937	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV
Desertqueen, very rarely flooded----	15	4-15	3199-4003	4-7	Hills and fan piedmont	Low hill	Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss	Cool Shallow Fans Over Pediment, R030XB188CA
4091: Littlefargo-----	85	4-15	4003-5200	4-7	Hills	Hill and pediment	Colluvium derived from granitoid over residuum weathered from granitoid	Cool Deep Sandy Fans, R030XB168CA
4245: Bluecut-----	40	4-8	2953-4298	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granite and gneiss	Loamy Very Deep Fan Remnants, R030XB183CA
Morongo, very rarely flooded----	25	4-8	2953-3970	4-7	Fan piedmont	Fan apron	Alluvium derived from granite and gneiss	Sandy Fan Aprons, R030XB174CA



Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope		Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
		Pct	Pct						
				<u>Ft</u>	<u>In</u>				
4245: Yander, very rarely flooded----	15	4-8		2986-4298	4-7	Fan piedmont	Fan apron on pediment	Alluvium derived from granite and gneiss over residium weathered from granite	Sandy Fan Aprons, R030XB174CA
4260: Minhoht-----	45	2-8		2231-3412	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or gneiss	Very Shallow Duripan Fan Remnants, R030XB220CA
Corbilt, rarely flooded-----	40	2-8		2231-3412	4-7	Fan piedmont	Fan apron on fan remnant	Alluvium derived from granitoid	Moderately Deep To Very Deep Loamy Fan Remnants, R030XB218CA
4265: Werewolf, warm----	80	4-15		2034-2346	3-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid	LIMY 3-5 P.Z., R030XB019NV
4270: Yuccabutte, extremely cobbly sandy loam-----	95	8-50		2362-3691	4-7	Fan piedmont	Ballena	Alluvium derived from igneous rock	Limy Hill 5-7" p.z., R030XB140CA
4271: Yuccabutte, warm---	60	4-15		2608-3363	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or gneiss	Limy 5-7" p.z. (Low Production), R030XB156CA
Arizo, rarely flooded-----	30	2-8		2612-3346	5-7	Fan piedmont	Inset fan	Alluvium derived from granitoid and/or gneiss	Gravelly Outwash, R030XY159CA
4275: Pinkcan-----	35	2-8		2421-3822	4-7	Fan piedmont	Fan remnant	None assigned	LIMY 5-7 P.Z., R030XB005NV
Werewolf-----	25	2-8		2421-3691	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or gneiss	LIMY 5-7 P.Z., R030XB005NV
Gocougs, warm-----	15	2-8		2421-3825	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
4280: Mekkadale-----	55	4-30	3051-3346	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid	Limy Hill 3-5" P.Z., R030XB139CA
Edalphi, warm-----	25	15-30	3051-3281	4-7	Fan piedmont	South-facing side slopes of fan remnant	Alluvium derived from granitoid	Limy Hill 3-5" P.Z., R030XB139CA
4285: Typic Argidurids---	35	8-30	3166-3412	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or gneiss	Limy Hill 5-7" p.z., R030XB140CA
Coppermine-----	30	8-30	3182-3412	4-7	Fan piedmont	Pediment	Alluvium derived from granitoid and/or gneiss	Limy Hill 3-5" P.Z., R030XB139CA
Minhoys, warm-----	25	4-15	3199-3445	4-7	Fan piedmont	Fan remnant	Alluvium derived from granitoid and/or gneiss	Limy Hill 5-7" p.z., R030XB140CA
4403: Arizo, rarely flooded, channeled	50	2-8	2920-3264	5-7	Fan piedmont	Lower part of alluvial fan	Alluvium derived from granitoid and/or gneiss	Flooded Gravelly Fans, R030XY038CA
Arizo, rarely flooded-----	25	2-8	2920-3264	5-7	Fan piedmont	Drainage way	Alluvium derived from granitoid and/or gneiss	Mid Size Thermic To Hyperthermic Ephemer al Stream, R030XY186CA
Arizo-----	20	2-8	2920-3264	5-7	Fan piedmont	Upper part of alluvial fan	Alluvium derived from granitoid and/or gneiss	LIMY 5-7 P.Z., R030XB005NV
4440: Dragonwash, occasionally flooded-----	55	2-4	2133-3061	4-7	Fan piedmont	Bars of drainage way	Alluvium derived from igneous and metamorphic rock	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream, R030XY010CA

Table 3.--Climate, Landscape, Landform, Parent Material, and Ecological Site--Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
4440: Dragonwash, frequently flooded	35	2-4	2133-3061	4-7	Fan piedmont	Active drainageway	Alluvium derived from igneous and metamorphic rock	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream, R030XY010CA
4450: Morongo, occasionally flooded-----	75	2-4	3360-3750	4-7	Fan piedmont	Drainageway	Alluvium derived from granitoid	Large, Sandy, Thermic, Ephemeral Stream, R030XY167CA
Morongo, frequently flooded	15	2-4	3360-3750	4-7	Fan piedmont	Active channel	Alluvium derived from granitoid	Large, Sandy, Thermic, Ephemeral Stream, R030XY167CA
4605: Pinicity, moist----	80	2-8	3711-4626	4-7	Fan piedmont	Fan apron on pediment	Alluvium and/or colluvium derived from granite or granitoid over residium weathered from granite and/or granitoid	Cool Shallow Fans Over Pediment, R030XB188CA
4606: Pinicity-----	60	4-15	3609-4652	4-7	Fan piedmont	Fan apron on pediment	Alluvium derived from granite over residium weathered from granite	Dissected Pediment, Cool, R030XB166CA
4607: Pinicity-----	85	4-8	3855-4445	4-7	Fan piedmont	Fan apron on pediment	Alluvium derived from granitoid over residuum weathered from granitoid	Dissected Pediment, Cool, R030XB166CA
4608: Pinicity-----	60	4-15	4232-5184	4-7	Fan piedmont	Fan apron on pediment	Alluvium derived from granitoid over residuum weathered from granitoid	Dissected Pediment, Cool, R030XB166CA

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	<u>Pct</u>	<u>Pct</u>	<u>Ft</u>	<u>In</u>				
4610: Desertqueen-----	35	2-8	3691-5134	4-7	Fan piedmont	Flat summits on pediment	Residuum weathered from granite	Cool Shallow Fans Over Pediment, R030XB188CA
Jumborox, warm-----	25	4-8	3691-5134	4-7	Fan piedmont	Fan remnant	Alluvium derived from granite	Loamy Very Deep Fan Remnants, R030XB183CA
4615: Desertqueen, cool---	45	15-30	4380-5118	4-7	Hills	Hill	Colluvium derived from granite and gneiss over residuum weathered from granite and gneiss	Dissected Pediment, Cool, R030XB166CA
Jumborox-----	25	4-15	4380-5118	4-7	Fan piedmont	Fan remnant	Alluvium derived from gneiss and/or alluvium derived from granitoid	Cool Deep Sandy Fans, R030XB168CA
4620: Stranger-----	40	8-50	2887-3888	4-7	Fan piedmont	Pediment	Residuum weathered from granitoid	Warm Sloping Pediments, R030XB225CA
Grubstake, moist---	20	8-30	2821-3888	4-7	Fan piedmont	Pediment	Residuum weathered from granitoid	Limy Hill 5-7" p.z., R030XB140CA
4625: Grinder-----	50	4-30	2904-4035	4-7	Fan piedmont	Pediment	Residuum weathered from granitoid	Loamy Fan Remnants And Pediments, R030XB221CA
Grinder, cool-----	20	4-30	2904-4035	4-7	Fan piedmont	Pediment	Residuum weathered from granitoid	Warm Sloping Pediments, R030XB225CA
Pinkcan, cool-----	15	4-15	2904-4003	4-7	Fan piedmont	Fan remnant	None assigned	Loamy Fan Remnants And Pediments, R030XB221CA
4630: Thunderclap-----	50	4-8	4495-5134	7-10	Hills	Fan apron on pediment	Alluvium derived from granitoid and/or alluvium derived from gneiss over residuum weathered from granitoid and/or residuum weathered from gneiss	Xeric Very Deep Sandy Fan Aprons On Pediments, R030XE200CA

Soil Survey of Joshua Tree National Park, California

Table 3.-Climate, Landscape, Landform, Parent Material, and Ecological Site-Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
4630: Smithcanyon-----	30	8-15	4495-4757	7-10	Hills	Low hill	Colluvium derived from gneiss and/or colluvium derived from granitoid over residuum weathered from gneiss and/or residuum weathered from granitoid	Sandy Xeric-Intergrade Slopes, R030XE196CA
4804: Ironped-----	25	30-60	2953-4003	4-7	Hills and mountains	South-facing side slopes and/or hill slopes at elevations below 4000 ft	Residuum weathered from granite	Warm Gravelly Shallow Hills, R030XB172CA
Pinecity-----	20	30-50	3609-4626	4-7	Hills and mountains	North-facing side slopes and/or hill slopes at elevations below 4000 ft	Colluvium derived from granite over residuum weathered from granite	Shallow Sandy Cool Hills, R030XB189CA
4805: Ironped, cool-----	30	8-15	2904-3199	4-7	Fan piedmont	Fan apron on pediment	Alluvium derived from granite over residuum weathered from granite	Dissected Pediment, R030XB171CA
4811: Pioneertown-----	10	30-60	4003-5800	5-8	Hills	Hill	Colluvium and residuum derived from/weathered from granite	Bouldery Very Shallow To Shallow Gravelly Slopes, R030XB170CA
4825: Cajon, rarely flooded-----	20	4-8	2316-3150	3-7	Fan piedmont	Fan apron	Alluvium derived from granitoid	LIMY 5-7 P.Z., R030XB005NV
Grubstake-----	20	2-15	2395-3150	4-7	Fan piedmont	Pediment	Residuum weathered from granitoid	Warm Shallow Pediments, R030XB228CA
Stranger, warm-----	15	2-15	2313-3150	4-7	Fan piedmont	Pediment	Residuum weathered from granitoid	Warm Shallow Pediments, R030XB228CA

Table 3.—Climate, Landscape, Landform, Parent Material, and Ecological Site—Continued

Map unit symbol, soil name, and phase	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	<u>Pct</u>	<u>Pct</u>	<u>Ft</u>	<u>In</u>				
4830: Pinecity, cool-----	10	8-30	2789-5020	4-7	Hills and associated pediment	Areas within rock outcrop on pediment	Colluvium derived from granitoid over residuum weathered from granitoid	Bouldery Very Shallow To Shallow Gravelly Slopes, R030XB170CA
4900: Aguilareal-----	15	8-50	2379-3642	4-7	Hills	Hill	Colluvium derived from granitoid over residuum weathered from granitoid	Warm Gravelly Shallow Hills, R030XB172CA
Lostpalms-----	15	8-50	2100-3609	4-7	Hills	Hill	Residuum weathered from granitoid	Warm Gravelly Shallow Hills, R030XB172CA



# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation

(Only soils and miscellaneous land types with correlated ecological sites are shown)

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
1220:			
60%-Jadestorm-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
20%-Blackeagle, cool-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
6%-Whipple-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
3%-Dalelake, thick sandy surface--	Hyperthermic Sandy Plains	Rangeland	R030XD014CA
1%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1225:			
65%-Blackeagle-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
10%-Jadestorm-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
5%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
5%-Whipple, moist-----	Very Shallow To Moderately Deep Gravelly Slopes	Rangeland	R030XB193CA
1230:			
45%-Jadestorm-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
20%-Jadestorm, cool-----	Hyperthermic Dry Hills	Rangeland	R030XD001CA
10%-Meccapass, dry-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
6%-Meccapass-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
3%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1%-Dalelake-----	Hyperthermic Sandhill	Rangeland	R030XD008CA
1240:			
45%-Meccapass-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
20%-Bulletproof-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
10%-Meccapass-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
5%-Jadestorm, moist-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA

# Soil Survey of Joshua Tree National Park, California

Table 4.—Ecological Site-Soil Correlation—Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
1240:			
5%-Seanna-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
2%-Fanhill, moist-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
2%-Marbolite, cool-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
1%-Carrizo, occasionally flooded--	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
1241:			
45%-Meccapass-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
20%-Seanna-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
20%-Contactmine, dry-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
4%-Cajon, rarely flooded-----	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
2%-Whiterobe-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
1%-Ironped, moist-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA
1242:			
40%-Meccapass-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
25%-Jadestorm-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
9%-Contactmine, hot-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
5%-Meccapass, cool-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
2%-Bulletproof-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
2%-Jadestorm, moist-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
1%-Carrizo, occasionally flooded--	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
1%-Fanhill, moist-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
1250:			
50%-Ironlung-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
20%-Ironlung, cool-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
3%-Ironlung, rubbly, cool-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
1250:			
3%-Ironped, cool-----	Moderately Deep Gravelly Mountain Slopes	Rangeland	R030XB213CA
3%-Whiterobe-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
2%-Carrizo, occasionally flooded--	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
2%-Whiterobe, cool-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
1%-Bolero, moist-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
1%-Pintobasin, steep, moist-----	Coarse Gravelly Fans	Rangeland	R030XD039CA
1255:			
40%-Goldenhills-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
15%-Bulletproof-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
15%-Fanhill-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
15%-Whiterobe-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
2%-Ironlung, rubbly-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
2%-Ironped, cool-----	Moderately Deep Gravelly Mountain Slopes	Rangeland	R030XB213CA
2%-Carrizo, occasionally flooded--	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
1%-Rubylee, very rarely flooded---	Coarse Gravelly Fans	Rangeland	R030XD039CA
1260:			
45%-Whiterobe-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
20%-Bigbernie-----	Moderately Deep Gravelly Mountain Slopes	Rangeland	R030XB213CA
15%-Whiterobe, cool-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
7%-Bigbernie, strongly sloping---	Moderately Deep Gravelly Mountain Slopes	Rangeland	R030XB213CA
3%-Carrizo, occasionally flooded--	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
1410:			
50%-Missionwell-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
1410:			
15%-Missionwell, high elevation---	Hyperthermic Dry Hills	Rangeland	R030XD001CA
10%-Typic Haplocalcids, volcanic---	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
3%-Missionwell, strongly alkaline-	Hyperthermic Saline Hill	Rangeland	R030XD152CA
2%-Dalelake, thick sandy surface--	Hyperthermic Sandy Plains	Rangeland	R030XD014CA
1415:			
60%-Bolero-----	Hyperthermic Dry Hills	Rangeland	R030XD001CA
10%-Goldenhills, dry-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
5%-Ironlung-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
3%-Supplymine, dry-----	Hyperthermic Dry Hills	Rangeland	R030XD001CA
2%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1504:			
50%-Rizzo, rarely flooded, stony--	Cobbly Fan Remnants	Rangeland	R031XY201CA
35%-Rizzo, occasionally flooded, stony-----	Stony, Occasionally Flooded Ephemeral Stream	Rangeland	R031XY202CA
8%-Rockhound, cobbly-----	Cobbly Fan Remnants	Rangeland	R031XY201CA
7%-Rizzo, frequently flooded, rubbly-----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
1510:			
85%-Carrizo, very gravelly sandy loam-----	Hyperthermic Fans	Rangeland	R030XD015CA
6%-Oldale-----	Desert Pavement	Rangeland	R030XY002CA
5%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
4%-Pintobasin, overblown-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
1511:			
75%-Carrizo, channeled-----	Flooded Gravelly Fans	Rangeland	R030XY038CA
15%-Carrizo, occasionally flooded-	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream	Rangeland	R030XY001CA
10%-Carrizo, occasionally flooded, channeled-----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
1512:			
80%-Carrizo, extremely gravelly sandy loam-----	Hyperthermic Fans	Rangeland	R030XD015CA
10%-Carrizo, rarely flooded-----	Hyperthermic Fans	Rangeland	R030XD015CA
3%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
3%-Carrizo, channeled-----	Flooded Gravelly Fans	Rangeland	R030XY038CA
2%-Carrizo, occasionally flooded--	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream	Rangeland	R030XY001CA
2%-Oldale-----	Desert Patina	Rangeland	R030XY002CA
1513:			
60%-Carrizo-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
20%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
15%-Rubylee-----	Desert Pavement	Rangeland	R030XY002CA
5%-Oldale-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
1514:			
40%-Carrizo, rarely flooded-----	Hyperthermic Fans	Rangeland	R030XD015CA
30%-Pintobasin, fine sandy loam---	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
15%-Rubylee-----	Desert Pavement	Rangeland	R030XY002CA
10%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
5%-Oldale-----	Desert Pavement	Rangeland	R030XY002CA
1515:			
80%-Pintobasin-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
15%-Carrizo, occasionally flooded-	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream	Rangeland	R030XY001CA
2%-Carrizo, frequently flooded---	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
2%-Duric Petroargids-----	Hyperthermic Fans	Rangeland	R030XD015CA
1516:			
90%-Pintobasin, fine sandy loam---	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
7%-Pintobasin, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
3%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
1517:			
65%-Pintobasin-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
25%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
4%-Pintobasin, occasionally flooded, broad-----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
3%-Pintobasin, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
2%-Carpetflat-----	Desert Pavement	Rangeland	R030XY002CA
1%-Perurose-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
1520:			
80%-Pintobasin, loamy sand-----	Hyperthermic Fans	Rangeland	R030XD015CA
5%-Carrizo, rarely flooded-----	Hyperthermic Fans	Rangeland	R030XD015CA
5%-Joetree-----	Hyperthermic Fans	Rangeland	R030XD015CA
5%-Pintobasin, rarely flooded, channeled-----	Channeled Warm Alluvial Fans	Rangeland	R030XD041CA
4%-Pintobasin, frequently flooded-	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
1522:			
85%-Pintobasin, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
5%-Pintobasin-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
3%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
3%-Pintobasin, occasionally flooded-----	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream	Rangeland	R030XY001CA
2%-Pintobasin, frequently flooded-	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
1%-Dalelake, thick sandy surface--	Hyperthermic Sandy Plains	Rangeland	R030XD014CA
1%-Rubylee-----	Desert Pavement	Rangeland	R030XY002CA
1523:			
50%-Pintobasin, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
25%-Aquapeak-----	Desert Pavement	Rangeland	R030XY002CA
20%-Pintobasin, occasionally flooded-----	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream	Rangeland	R030XY001CA
5%-Rubylee, rarely flooded-----	Hyperthermic Fans	Rangeland	R030XD015CA



# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
1524:			
90%-Pintobasin, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
5%-Pintobasin, occasionally flooded, broad-----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
2%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
2%-Pintobasin, frequently flooded--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
1%-Carrizo, occasionally flooded--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
1525:			
45%-Pintobasin, occasionally flooded-----	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream	Rangeland	R030XY001CA
35%-Pintobasin, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
10%-Pintobasin-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
5%-Carrizo, frequently flooded----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
5%-Rubylee, rarely flooded-----	Hyperthermic Fans	Rangeland	R030XD015CA
1526:			
55%-Pintobasin, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
20%-Joetree-----	Hyperthermic Fans	Rangeland	R030XD015CA
15%-Patscamp-----	Hyperthermic Fans	Rangeland	R030XD015CA
5%-Pintobasin, rarely flooded, channeled-----	Channeled Warm Alluvial Fans	Rangeland	R030XD041CA
3%-Sunmill-----	Hyperthermic Fans	Rangeland	R030XD015CA
1%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
1%-Pintobasin, frequently flooded--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
1527:			
90%-Pintobasin, moist-----	Coarse Gravelly Fans	Rangeland	R030XD039CA
7%-Pintobasin, occasionally flooded, gravelly surface-----	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
3%-Carrizo, frequently flooded----	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
1530:			
85%-Dalelake, fine sand-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
5%-Pintobasin, occasionally flooded-----	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream	Rangeland	R030XY001CA
5%-Pintobasin-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
5%-Typic Torriorthents-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
1531:			
60%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
30%-Pintobasin, rarely flooded---	Hyperthermic Fans	Rangeland	R030XD015CA
4%-Joetree, overblown-----	Hyperthermic Sandy Plains	Rangeland	R030XD014CA
3%-Pintobasin, frequently flooded-	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
3%-Rubylee, rarely flooded-----	Hyperthermic Fans	Rangeland	R030XD015CA
1540:			
35%-Carrizo, very rarely flooded--	Coarse Gravelly Fans	Rangeland	R030XD039CA
25%-Carrizo, stable-----	Desert Pavement	Rangeland	R030XY002CA
20%-Carrizo, occasionally flooded, rocky surface-----	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream	Rangeland	R030XY021CA
20%-Russioks-----	Desert Pavement	Rangeland	R030XY002CA
1541:			
50%-Carrizo, stable-----	Desert Pavement	Rangeland	R030XY002CA
40%-Cambidic Haplodurids-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
5%-Cambidic Haplodurids, sandy surface-----	Dune 3-5" P.Z.	Rangeland	R030XY154CA
3%-Deprave-----	Desert Pavement 2-4" p.z.	Rangeland	R031XY002CA
2%-Cambidic Haplodurids, rarely flooded-----	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream	Rangeland	R030XY021CA
1542:			
70%-Carrizo, very rarely flooded--	Coarse Gravelly Fans	Rangeland	R030XD039CA
20%-Carrizo, occasionally flooded-	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
6%-Carrizo, steep-----	Coarse Gravelly Fans	Rangeland	R030XD039CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
1542:			
3%-Carrizo, frequently flooded----	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
1%-Pintobasin, moist-----	Coarse Gravelly Fans	Rangeland	R030XD039CA
1550:			
35%-Buzzardsprings, stable-----	Desert Pavement	Rangeland	R030XY002CA
25%-Coxpin-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
20%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
10%-Perurose, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
8%-Pintobasin, stable-----	Desert Pavement	Rangeland	R030XY002CA
2%-Missionwell-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
1555:			
35%-Goldrose-----	Rarely Flooded Fans	Rangeland	R031XY200CA
30%-Carsitas, very rarely flooded-	Rarely Flooded Fans	Rangeland	R031XY200CA
25%-Chemwash, rarely flooded----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
7%-Rizzo, extremely stony-----	Extremely Stony Fan Remnants	Rangeland	R031XY030CA
2%-Chemwash, occasionally flooded-	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
2003:			
100%-Emptygun-----	Steep South Slope 2-4" p.z.	Rangeland	R031XY003CA
2060:			
35%-Joetree, very rarely flooded--	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
30%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
25%-Pintobasin, fine sandy loam---	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
5%-Patscamp, frequently flooded---	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
5%-Pintobasin, occasionally flooded-----	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream	Rangeland	R030XY001CA
2065:			
30%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
25%-Aquapeak-----	Desert Pavement	Rangeland	R030XY002CA
25%-Coxpin-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
10%-Perurose, gravelly surface----	Desert Pavement	Rangeland	R030XY002CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
2065:			
5%-Perurose-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
2%-Carrizo, frequently flooded----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
1%-Buzzardsprings, fine sand-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
1%-Carrizo-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
1%-Sunmill-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
2067:			
30%-Aquapeak, overblown-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
25%-Buzzardsprings-----	Hyperthermic Fans	Rangeland	R030XD015CA
20%-Dalelake, thick sandy surface-	Hyperthermic Sandy Plains	Rangeland	R030XD014CA
15%-Buzzardsprings, steep-----	Hyperthermic Dry Hills	Rangeland	R030XD001CA
5%-Missionsweet, moist-----	Hyperthermic Dry Hills	Rangeland	R030XD001CA
3%-Rainbowsend, dry-----	Hyperthermic Dry Hills	Rangeland	R030XD001CA
2%-Typic Torriorthents-----	Hyperthermic Dry Hills	Rangeland	R030XD001CA
2068:			
45%-Aquapeak-----	Desert Pavement	Rangeland	R030XY002CA
35%-Carpetflat, nongravelly surface-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
15%-Pintobasin-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
2%-Missionsweet-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
1%-Carrizo, occasionally flooded, rocky surface-----	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream	Rangeland	R030XY021CA
1%-Rubylee, nongravelly surface---	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
1%-Rubylee-----	Desert Pavement	Rangeland	R030XY002CA
2070:			
60%-Missionsweet-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
25%-Carpetflat-----	Desert Pavement	Rangeland	R030XY002CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
2070:			
6%-Carrizo, occasionally flooded, rocky surface-----	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream	Rangeland	R030XY021CA
5%-Rubylee-----	Desert Pavement	Rangeland	R030XY002CA
4%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
2075:			
50%-Oldale-----	Desert Pavement	Rangeland	R030XY002CA
30%-Missionsweet-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
10%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
8%-Carpetflat-----	Desert Pavement	Rangeland	R030XY002CA
1%-Missionsweet, steep-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
2076:			
40%-Oldale-----	Desert Pavement	Rangeland	R030XY002CA
30%-Carrizo-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
10%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
7%-Goldenbell-----	Desert Pavement	Rangeland	R030XY002CA
6%-Missionsweet-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
5%-Carrizo, occasionally flooded, rocky surface-----	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream	Rangeland	R030XY021CA
2%-Pintobasin, very rarely flooded	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
2077:			
50%-Oldale-----	Desert Pavement	Rangeland	R030XY002CA
25%-Carrizo-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
15%-Carrizo, very rarely flooded--	Coarse Gravelly Fans	Rangeland	R030XD039CA
10%-Carrizo, occasionally flooded, rocky surface-----	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream	Rangeland	R030XY021CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
2085:			
45%-Rainbowsend-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
35%-Goldenbell-----	Desert Pavement	Rangeland	R030XY002CA
10%-Blackeagle, cool-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
5%-Carrizo, occasionally flooded, channeled-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
2090:			
35%-Deprave-----	Desert Pavement 2-4" p.z.	Rangeland	R031XY002CA
25%-Rockhound-----	Desert Pavement 2-4" p.z.	Rangeland	R031XY002CA
20%-Rizzo-----	Gravelly Fan Remnants And Fan Aprons	Rangeland	R031XY009CA
10%-Roostertail, stable-----	Desert Pavement 2-4" p.z.	Rangeland	R031XY002CA
3%-Rizzo, frequently flooded-----	Large, High Intensity, Frequently Flooded Ephemeral Stream	Rangeland	R031XY026CA
3%-Rizzo, occasionally flooded, rocky surface-----	Very Gravelly Wash	Rangeland	R031XY021CA
2%-Deprave, moderately steep-----	Limy Hill 2-6" p.z.	Rangeland	R031XY004CA
2%-Kenalduma-----	Cobbly Fan Remnants	Rangeland	R031XY201CA
2091:			
60%-Deprave-----	Desert Pavement 2-4" p.z.	Rangeland	R031XY002CA
15%-Roostertail-----	Limy 2-4" p.z.	Rangeland	R031XY006CA
10%-Snaggletooth-----	Desert Pavement 2-4" p.z.	Rangeland	R031XY002CA
10%-Typic Torriorthents, frequently flooded-----	Frequently Flooded, Confined Ephemeral Stream	Rangeland	R031XY029CA
5%-Descent-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
2100:			
50%-Perurose-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
25%-Coxpin-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
15%-Pintobasin, gravelly surface--	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
5%-Pintobasin, rarely flooded, channeled-----	Channeled Warm Alluvial Fans	Rangeland	R030XD041CA
2%-Rubylee, sandy surface-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA



# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
2100:			
1%-Aquapeak, extremely stony-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
1%-Carpetflat, sandy substratum---	Channeled Warm Alluvial Fans	Rangeland	R030XD041CA
1%-Pintobasin, steep-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
2101:			
60%-Perurose, rarely flooded-----	Hyperthermic Fans	Rangeland	R030XD015CA
35%-Pintobasin, rarely flooded---	Hyperthermic Fans	Rangeland	R030XD015CA
5%-Coxpin-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
2110:			
80%-Descent-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
15%-Descent, stable-----	Desert Pavement	Rangeland	R030XY002CA
5%-Carrizo, occasionally flooded, rocky surface-----	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream	Rangeland	R030XY021CA
2111:			
45%-Descent, warm-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
40%-Rubylee, very rarely flooded--	Coarse Gravelly Fans	Rangeland	R030XD039CA
5%-Carrizo, occasionally flooded--	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
2120:			
35%-Rizzo, rarely flooded-----	Rarely Flooded Fans	Rangeland	R031XY200CA
35%-Deprave-----	Desert Pavement 2-4" p.z.	Rangeland	R031XY002CA
20%-Rizzo, frequently flooded----	Frequently Flooded, Confined Ephemeral Stream	Rangeland	R031XY029CA
10%-Rizzo, very rarely flooded---	Limy 2-4" p.z.	Rangeland	R031XY006CA
2121:			
90%-Rizzo, rubbly-----	Extremely Stony Fan Remnants	Rangeland	R031XY030CA
10%-Rizzo, frequently flooded----	Large, High Intensity, Frequently Flooded Ephemeral Stream	Rangeland	R031XY026CA
2130:			
55%-Goldenbell-----	Desert Pavement	Rangeland	R030XY002CA
40%-Descent-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
4%-Rizzo, frequently flooded----	Frequently Flooded, Confined Ephemeral Stream	Rangeland	R031XY029CA
1%-Descent, eroded-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
2140:			
85%-Rockhound, cobbly-----	Cobbly Fan Remnants	Rangeland	R031XY201CA
10%-Rockhound, rarely flooded----	Rarely Flooded Fans	Rangeland	R031XY200CA
5%-Rizzo, occasionally flooded, stony-----	Stony, Occasionally Flooded Ephemeral Stream	Rangeland	R031XY202CA
2402:			
70%-Rizzo-----	Gravelly Fan Remnants And Fan Aprons	Rangeland	R031XY009CA
20%-Rizzo, frequently flooded----	Large, High Intensity, Frequently Flooded Ephemeral Stream	Rangeland	R031XY026CA
7%-Deprave-----	Desert Pavement 2-4" p.z.	Rangeland	R031XY002CA
1%-Carsitas-----	Limy Hill 2-6" p.z.	Rangeland	R031XY004CA
1%-Catfishbay-----	Limy 2-4" p.z.	Rangeland	R031XY006CA
2403:			
80%-Rizzo-----	Gravelly Fan Remnants And Fan Aprons	Rangeland	R031XY009CA
15%-Rizzo, occasionally flooded---	Coarse Gravelly Wash	Rangeland	R031XY019CA
3%-Deprave-----	Desert Pavement 2-4" p.z.	Rangeland	R031XY002CA
2%-Rizzo, moderately steep-----	Limy Hill 2-6" p.z.	Rangeland	R031XY004CA
2404:			
60%-Rizzo, occasionally flooded---	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
35%-Rizzo, very rarely flooded----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
3%-Rizzo, frequently flooded----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
2405:			
65%-Carrizo, rarely flooded-----	Hyperthermic Fans	Rangeland	R030XD015CA
25%-Carrizo, occasionally flooded-	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
9%-Oldale-----	Desert Pavement	Rangeland	R030XY002CA
1%-Carrizo, frequently flooded----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
2406:			
50%-Pintobasin, frequently flooded-	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
2406:			
40%-Carrizo, occasionally flooded-	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
10%-Pintobasin, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
2407:			
45%-Pintobasin, rarely flooded----	Hyperthermic Fans	Rangeland	R030XD015CA
30%-Carrizo, occasionally flooded-	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
20%-Carrizo, frequently flooded---	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
5%-Aquapeak-----	Desert Pavement	Rangeland	R030XY002CA
2408:			
55%-Rizzo, frequently flooded----	Large, High Intensity, Frequently Flooded Ephemeral Stream	Rangeland	R031XY026CA
35%-Rizzo, very rarely flooded----	Large, High Intensity, Frequently Flooded Ephemeral Stream	Rangeland	R031XY026CA
3%-Rizzo, strongly sloping-----	Limy Hill 2-6" p.z.	Rangeland	R031XY001CA
3%-Rockhound, overwash-----	Extremely Stony Fan Remnants	Rangeland	R031XY030CA
2%-Deprave, overwash-----	Extremely Stony Fan Remnants	Rangeland	R031XY030CA
2%-Rizzo, gravelly surface-----	Gravelly Fan Remnants And Fan Aprons	Rangeland	R031XY009CA
2409:			
35%-Rizzo, frequently flooded----	Large, High Intensity, Frequently Flooded Ephemeral Stream	Rangeland	R031XY026CA
30%-Chemwash, frequently flooded--	Large, High Intensity, Frequently Flooded Ephemeral Stream	Rangeland	R031XY026CA
25%-Carsitas, occasionally flooded, braided-----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
5%-Rizzo, extremely stony-----	Extremely Stony Fan Remnants	Rangeland	R031XY030CA
4%-Goldrose-----	Rarely Flooded Fans	Rangeland	R031XY200CA
2420:			
45%-Carsitas, frequently flooded--	Valley Wash	Rangeland	R031XY010CA
40%-Carsitas, occasionally flooded	Valley Wash	Rangeland	R031XY010CA
15%-Carsitas, rarely flooded-----	Coarse Gravelly Wash	Rangeland	R031XY019CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
2421:			
55%-Carsitas, very rarely flooded-	Rarely Flooded Fans	Rangeland	R031XY200CA
25%-Carsitas, rarely flooded-----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
10%-Carsitas, occasionally flooded, braided-----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
5%-Rizzo, very rarely flooded----	Rarely Flooded Fans	Rangeland	R031XY200CA
2%-Chemwash, frequently flooded---	Large, High Intensity, Frequently Flooded Ephemeral Stream	Rangeland	R031XY026CA
2%-Typic Haplargids, very rarely flooded-----	Rarely Flooded Fans	Rangeland	R031XY200CA
2431:			
60%-Chemwash, frequently flooded, braided-----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
25%-Chemwash, frequently flooded--	Large, High Intensity, Frequently Flooded Ephemeral Stream	Rangeland	R031XY026CA
10%-Chemwash, rarely flooded-----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
3%-Cajon, occasionally flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
2440:			
35%-Rizzo-----	Gravelly Fan Remnants And Fan Aprons	Rangeland	R031XY009CA
30%-Rizzo, occasionally flooded---	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
15%-Rizzo, extremely stony-----	Extremely Stony Fan Remnants	Rangeland	R031XY030CA
10%-Rizzo, frequently flooded-----	Frequently Flooded, Confined Ephemeral Stream	Rangeland	R031XY029CA
10%-Rizzo, steep-----	Limy Hill 2-6" p.z.	Rangeland	R031XY001CA
2715:			
35%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
30%-Sheephole-----	Hyperthermic Sandy Plains	Rangeland	R030XD014CA
25%-Pintobasin-----	Dry Deep Sandy Fan Aprons	Rangeland	R030XD006CA
6%-Dalelake, strongly sloping----	Hyperthermic Sandhill	Rangeland	R030XD008CA
4%-Carrizo, frequently flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
2716:			
75%-Dalelake, steep-----	Hyperthermic Sandhill	Rangeland	R030XD008CA
20%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
5%-Perurose-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
2717:			
40%-Dalelake-----	Hyperthermic Sandhill	Rangeland	R030XD008CA
20%-Buzzardsprings, fine sand----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
9%-Missionwell-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
5%-Dalelake, moderately sloping---	Hyperthermic Sandsheets	Rangeland	R030XD025CA
1%-Impedimenta-----	Hyperthermic Dissected Shallow Pediment	Rangeland	R030XD023CA
2718:			
55%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
45%-Sheephole, gravelly surface---	Hyperthermic Sandsheets	Rangeland	R030XD025CA
2820:			
25%-Impedimenta-----	Hyperthermic Dissected Shallow Pediment	Rangeland	R030XD023CA
10%-Marbolite-----	Hyperthermic Dissected Shallow Pediment	Rangeland	R030XD023CA
4%-Pintobasin, occasionally flooded, narrow-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1%-Perurose-----	Hyperthermic Shallow to Moderately Deep Fan Remnants	Rangeland	R030XD042CA
2825:			
25%-Supplymine-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
15%-Bolero, dry-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
15%-Ironage-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
5%-Blackeagle-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
5%-Dalelake-----	Hyperthermic Sandsheets	Rangeland	R030XD025CA
2830:			
10%-Blackeagle, cool-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA
4%-Marbolite-----	Low-Production Hyperthermic Hills	Rangeland	R030XD004CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
2830:			
3%-Blackeagle-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
2%-Impedimenta-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
1%-Supplymine-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
2835:			
40%-Blackeagle-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
10%-Supplymine-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
4%-Rizzo, extremely stony-----	Extremely Stony Fan Remnants	Rangeland	R031XY030CA
3%-Aguilareal-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
1%-Rizzo, frequently flooded-----	Gravelly, Braided, Ephemeral Stream	Rangeland	R031XY034CA
2840:			
30%-Jadestorm-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
3%-Rizzo, extremely stony-----	Extremely Stony Fan Remnants	Rangeland	R031XY030CA
2%-Carrizo, frequently flooded---	Broad, Gravelly, Hyperthermic Ephemeral Stream	Rangeland	R030XY128CA
3110:			
40%-Coppermine, cool-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
30%-Stranger-----	Warm Sloping Pediments	Rangeland	R030XB225CA
10%-Supplymine-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
7%-Typic Petrocalcids-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
5%-Grubstake-----	Warm Shallow Pediments	Rangeland	R030XB228CA
1%-Stranger, frequently flooded---	Warm Sloping Pediments	Rangeland	R030XB225CA
3120:			
40%-Aguilareal-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
20%-Blackeagle-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
10%-Bigbernie, warm-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
5%-Contactmine-----	Shallow Cool Hills	Rangeland	R030XB189CA
5%-Pinecity, cool-----	Bouldery Very Shallow To Shallow Gravelly Slopes	Rangeland	R030XB170CA
3%-Lithic Haplocalcids-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
2%-Typic Haplargids-----	Shallow Cool Hills	Rangeland	R030XB189CA



# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
3213:			
35%-Dalvord-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA
30%-Aguilareal-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
5%-Dalvord, bouldery-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
5%-Langwell-----	Warm Sloping Pediments	Rangeland	R030XB225CA
3242:			
50%-Langwell-----	Warm Sloping Pediments	Rangeland	R030XB225CA
20%-Helendale, cool-----	Moderately Deep To Very Deep Loamy Fan Remnants	Rangeland	R030XB218CA
5%-Arizo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
3285:			
30%-Pinecity-----	Shallow Cool Hills	Rangeland	R030XB189CA
20%-Contactmine-----	Shallow Cool Hills	Rangeland	R030XB189CA
20%-Desertqueen-----	Shallow Cool Hills	Rangeland	R030XB189CA
8%-Littlefargo-----	Shallow Cool Hills	Rangeland	R030XB189CA
5%-Pinecity, low sloping-----	Shallow Cool Hills	Rangeland	R030XB189CA
2%-Pinecity, cool-----	Bouldery Very Shallow To Shallow Gravelly Slopes	Rangeland	R030XB170CA
3286:			
85%-Pinecity, gravelly loamy sand-	Shallow Cool Hills	Rangeland	R030XB189CA
6%-Desertqueen-----	Shallow Cool Hills	Rangeland	R030XB189CA
2%-Pinecity, steep, high elevation	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
3291:			
40%-Smithcanyon-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
25%-Stubbespring-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
8%-Smithcanyon, moderately steep--	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
5%-Contactmine-----	Shallow Cool Hills	Rangeland	R030XB189CA
2%-Pinecity-----	Shallow Cool Hills	Rangeland	R030XB189CA
3292:			
35%-Smithcanyon-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
25%-Pinecity-----	Shallow Cool Hills	Rangeland	R030XB189CA
5%-Lostpalms-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
4%-Thunderclap, rarely flooded----	Very Rarely To Rarely Flooded Thermic Ephemeral Stream	Rangeland	R030XY202CA
2%-Pinecity, very steep-----	Shallow Cool Hills	Rangeland	R030XB189CA
2%-Smithcanyon, very steep-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
2%-Smithcanyon, steep-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
3293:			
50%-Smithcanyon-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
25%-Pinecity-----	Shallow Cool Hills	Rangeland	R030XB189CA
5%-Pinecity, strongly sloping----	Shallow Cool Hills	Rangeland	R030XB189CA
4%-Pinecity, very steep-----	Shallow Cool Hills	Rangeland	R030XB189CA
4%-Smithcanyon, dry-----	Dry Sandy Mountain Slopes	Rangeland	R030XE191CA
4%-Smithcanyon, mesic-----	Dry Sandy Mountain Slopes	Rangeland	R030XE191CA
3%-Thunderclap, rarely flooded----	Xeric Very Deep Sandy Fan Aprons On Pediments	Rangeland	R030XE200CA
3294:			
80%-Smithcanyon, dry-----	Dry Sandy Mountain Slopes	Rangeland	R030XE191CA
10%-Smithcanyon, dry, moderately steep-----	Dry Sandy Mountain Slopes	Rangeland	R030XE191CA
3%-Xeric Torriorthents, dry-----	Dry Sandy Mountain Slopes	Rangeland	R030XE191CA
2%-Arizo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
3295:			
40%-Desertqueen, dry-----	Very Shallow To Moderately Deep Gravelly Slopes	Rangeland	R030XB193CA
20%-Hexie-----	Very Shallow To Moderately Deep Gravelly Slopes	Rangeland	R030XB193CA
10%-Helendale-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
5%-Contactmine, warm-----	Very Shallow To Moderately Deep Gravelly Slopes	Rangeland	R030XB193CA
3%-Contactmine, dry-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
2%-Pinecity-----	Shallow Cool Hills	Rangeland	R030XB189CA
3296:			
45%-Desertqueen-----	Shallow Cool Hills	Rangeland	R030XB189CA
35%-Pinecity-----	Shallow Cool Hills	Rangeland	R030XB189CA
6%-Smithcanyon-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
4%-Desertqueen, low slope-----	Shallow Cool Hills	Rangeland	R030XB189CA
3%-Pinecity, cool-----	Bouldery Very Shallow To Shallow Gravelly Slopes	Rangeland	R030XB170CA
2%-Littlefargo-----	Shallow Cool Hills	Rangeland	R030XB189CA
3297:			
40%-Desertqueen, warm-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
20%-Contactmine, dry-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
20%-Seanna, dry-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
3297:			
8%-Arizo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
2%-Arizo, occasionally flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
3325:			
30%-Ironped, warm-----	Thermic Steep South Slopes	Rangeland	R030XB164CA
15%-Hexie-----	Very Shallow To Moderately Deep Gravelly Slopes	Rangeland	R030XB193CA
15%-Ironped-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
10%-Pinecity, cool-----	Bouldery Very Shallow To Shallow Gravelly Slopes	Rangeland	R030XB170CA
3%-Aguilareal-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
3%-Desertqueen-----	Shallow Cool Hills	Rangeland	R030XB189CA
2%-Ironped, warm, moderatley steep	Thermic Steep South Slopes	Rangeland	R030XB164CA
1%-Morongo, occasionally flooded--	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1%-Smithcanyon-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
3335:			
40%-Xeric Torriorthents-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
25%-Xeric Torriorthents, warm----	Dry Sandy Mountain Slopes	Rangeland	R030XE191CA
10%-Smithcanyon, dry-----	Dry Sandy Mountain Slopes	Rangeland	R030XE191CA
3336:			
45%-Xeric Torriorthents-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
25%-Bigbernie-----	Moderately Deep Gravelly Mountain Slopes	Rangeland	R030XB213CA
8%-Goldenhills, warm-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
3%-Pinecity, warm-----	Moderately Deep Gravelly Mountain Slopes	Rangeland	R030XB213CA
2%-Arizo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
2%-Pinecity-----	Shallow Cool Hills	Rangeland	R030XB189CA
2%-Smithcanyon, dry-----	Dry Sandy Mountain Slopes	Rangeland	R030XE191CA
3340:			
35%-Seanna-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
20%-Grubstake, moist-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
15%-Pinecity-----	Shallow Cool Hills	Rangeland	R030XB189CA
10%-Seanna, non-rocky-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
3340:			
4%-Contactmine, dry-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
2%-Hexie-----	Very Shallow To Moderately Deep Gravelly Slopes	Rangeland	R030XB193CA
2%-Seanna, warm-----	Very Shallow To Moderately Deep Gravelly Slopes	Rangeland	R030XB193CA
1%-Cajon, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1%-Seanna, cool-----	Shallow Cool Hills	Rangeland	R030XB189CA
3345:			
55%-Bigcanyon-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
20%-Bigcanyon, cool-----	Moderately Deep Gravelly Mountain Slopes	Rangeland	R030XB213CA
10%-Ironped-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
7%-Smithcanyon, dry-----	Dry Sandy Mountain Slopes	Rangeland	R030XE191CA
3%-Whiterobe, cool-----	Hyperthermic Steep North Slopes	Rangeland	R030XD040CA
2%-Morongo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1%-Arizo, very rarely flooded----	Sandy Fan Aprons	Rangeland	R030XB174CA
3440:			
65%-Pacific Mesa, steep-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
30%-Pacific Mesa-----	Limy 5-7" p.z. (Low Production)	Rangeland	R030XB156CA
5%-Marsite-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA
3509:			
60%-Cajon, very rarely flooded----	Moderately Deep To Very Deep Loamy Fan Remnants	Rangeland	R030XB218CA
20%-Friedliver-----	Moderately Deep To Very Deep Loamy Fan Remnants	Rangeland	R030XB218CA
7%-Gocougs, warm-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
6%-Cajon-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
4%-Cajon, rarely flooded-----	Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream	Rangeland	R030XY188CA
2%-Olympus, rarely flooded-----	Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream	Rangeland	R030XY188CA
1%-Cajon, frequently flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
3525:			
70%-Cajon-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
15%-Friedliver-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
7%-Burntshack-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
3%-Silvermine-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
2%-Blackmagic-----	Desert Pavement	Rangeland	R030XY002CA
2%-Silvermine, stable-----	Desert Pavement	Rangeland	R030XY002CA
3526:			
40%-Cajon-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
35%-Hypoint-----	Gravelly Outwash	Rangeland	R030XY159CA
15%-Arizo, occasionally flooded---	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
5%-Arizo, frequently flooded-----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
5%-Helendale-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
3611:			
50%-Burntshack, sand surface-----	Sandy Fan Aprons	Rangeland	R030XB174CA
35%-Burntshack-----	Sandy Fan Aprons	Rangeland	R030XB174CA
10%-Morongo, very rarely flooded--	Sandy Fan Aprons	Rangeland	R030XB174CA
4%-Morongo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
3612:			
75%-Burntshack-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
20%-Burntshack, occasionally flooded-----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
5%-Arizo, occasionally flooded---	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
3676:			
80%-Morongo, loamy sand, very rarely flooded-----	Sandy Fan Aprons	Rangeland	R030XB174CA
10%-Jumborox, dry-----	Coarse Loamy Very Deep Fan Remnants	Rangeland	R030XB173CA
5%-Morongo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
4%-Morongo, frequently flooded---	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
3677:			
80%-Morongo-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
8%-Morongo, very rarely flooded---	Sandy Fan Aprons	Rangeland	R030XB174CA
5%-Ambrosia-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
5%-Jumborox, warm-----	Loamy Very Deep Fan Remnants	Rangeland	R030XB183CA
2%-Morongo, rarely flooded-----	Rarely Flooded Warm Thermic Ephemeral System	Rangeland	R030XY187CA
3679:			
55%-Morongo, cool-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
20%-Jumborox-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
8%-Bluecut, cool-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
7%-Morongo, cool, strongly sloping	Cool Deep Sandy Fans	Rangeland	R030XB168CA
5%-Jumborox, strongly sloping----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
3%-Morongo, very rarely flooded---	Very Rarely To Rarely Flooded Thermic Ephemeral Stream	Rangeland	R030XY202CA
2%-Morongo, rarely flooded-----	Very Rarely To Rarely Flooded Thermic Ephemeral Stream	Rangeland	R030XY202CA
3680:			
85%-Morongo-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
5%-Morongo, strongly sloping----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
4%-Helendale, very rarely flooded-	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
2%-Morongo, frequently flooded---	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
2%-Morongo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
3681:			
45%-Morongo, very rarely flooded--	Sandy Fan Aprons	Rangeland	R030XB174CA
35%-Jumborox, dry-----	Coarse Loamy Very Deep Fan Remnants	Rangeland	R030XB173CA
5%-Morongo, very rarely flooded, strongly sloping-----	Sandy Fan Aprons	Rangeland	R030XB174CA
4%-Desertqueen-----	Cool Shallow Fans Over Pediment	Rangeland	R030XB188CA
4%-Yander, very rarely flooded---	Sandy Fan Aprons	Rangeland	R030XB174CA
2%-Morongo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1%-Pinecity-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
3682:			
50%-Morongo, cool-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA



# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
3682:			
15%-Jumborox-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
7%-Jumborox, strongly sloping----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
6%-Morongo, very rarely flooded---	Very Rarely To Rarely Flooded Thermic Ephemeral Stream	Rangeland	R030XY202CA
5%-Morongo, cool strongly sloping-	Cool Deep Sandy Fans	Rangeland	R030XB168CA
2%-Morongo, rarely flooded-----	Very Rarely To Rarely Flooded Thermic Ephemeral Stream	Rangeland	R030XY202CA
3683:			
55%-Morongo-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
30%-Bluecut, very rarely flooded--	Very Rarely Flooded, Warm Thermic Fan Piedmonts	Rangeland	R030XB192CA
7%-Morongo, occasionally flooded--	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
3%-Cronese, very rarely flooded---	Very Rarely Flooded, Warm Thermic Fan Piedmonts	Rangeland	R030XB192CA
3%-Morongo, rarely flooded-----	Rarely Flooded Warm Thermic Ephemeral System	Rangeland	R030XY187CA
2%-Morongo, frequently flooded---	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
3684:			
85%-Morongo, warm-----	Very Rarely Flooded, Warm Thermic Fan Piedmonts	Rangeland	R030XB192CA
5%-Morongo, rarely flooded-----	Rarely Flooded Warm Thermic Ephemeral System	Rangeland	R030XY187CA
5%-Nasagold, warm-----	Very Rarely Flooded, Warm Thermic Fan Piedmonts	Rangeland	R030XB192CA
5%-Pinecity, moist-----	Cool Shallow Fans Over Pediment	Rangeland	R030XB188CA
3685:			
65%-Morongo, cool-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
15%-Desertqueen, undulating-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
8%-Morongo, very rarely flooded---	Very Rarely To Rarely Flooded Thermic Ephemeral Stream	Rangeland	R030XY202CA
5%-Jumborox-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
2%-Morongo, rarely flooded-----	Very Rarely To Rarely Flooded Thermic Ephemeral Stream	Rangeland	R030XY202CA
2%-Pinecity-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
3690:			
85%-Nasagold-----	Coarse Loamy Very Deep Fan Remnants	Rangeland	R030XB173CA
8%-Jumborox, warm-----	Loamy Very Deep Fan Remnants	Rangeland	R030XB183CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
3690:			
5%-Yander-----	Loamy Very Deep Fan Remnants	Rangeland	R030XB183CA
1%-Morongo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1%-Morongo, frequently flooded----	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
3695:			
80%-Gocougs-----	Moderately Deep To Very Deep Loamy Fan Remnants	Rangeland	R030XB218CA
10%-Popups, very rarely flooded----	Moderately Deep To Very Deep Loamy Fan Remnants	Rangeland	R030XB218CA
9%-Jetmine, very rarely flooded----	Warm Sloping Pediments	Rangeland	R030XB225CA
4031:			
50%-Crosgrain-----	Limy 5-7" p.z. (Low Production)	Rangeland	R030XB156CA
30%-Crackerjack-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA
15%-Pinkcan, dry-----	Limy 5-7" p.z. (Low Production)	Rangeland	R030XB156CA
5%-Crosgrain, steep-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA
4041:			
40%-Silvermine-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
30%-Helendale-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
20%-Burntshack, very rarely flooded-----	Sandy Plain 3-5" P.Z.	Rangeland	R030XB148CA
6%-Cajon-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
4%-Arizo, occasionally flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
4064:			
55%-Gravesumit-----	Granitic Loam	Rangeland	R030XB137CA
35%-Helendale, sandy surface-----	Granitic Loam	Rangeland	R030XB137CA
3%-Cajon, occasionally flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
3%-Gocougs-----	Moderately Deep To Very Deep Loamy Fan Remnants	Rangeland	R030XB218CA
2%-Cajon-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
2%-Hypoint-----	Gravelly Outwash	Rangeland	R030XY159CA
4071:			
65%-Helendale-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
15%-Desertqueen, very rarely flooded-----	Cool Shallow Fans Over Pediment	Rangeland	R030XB188CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
4071:			
5%-Morongo, occasionally flooded--	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
5%-Pinecity-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
3%-Morongo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
4091:			
85%-Littlefargo-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
3%-Pinecity-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
2%-Morongo, rarely flooded-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
4245:			
40%-Bluecut-----	Loamy Very Deep Fan Remnants	Rangeland	R030XB183CA
25%-Morongo, very rarely flooded--	Sandy Fan Aprons	Rangeland	R030XB174CA
15%-Yander, very rarely flooded---	Sandy Fan Aprons	Rangeland	R030XB174CA
10%-Yander, warm, very rarely flooded-----	Very Rarely Flooded, Warm Thermic Fan Piedmonts	Rangeland	R030XB192CA
5%-Jumborox, warm-----	Loamy Very Deep Fan Remnants	Rangeland	R030XB183CA
3%-Morongo, rarely flooded-----	Rarely Flooded Warm Thermic Ephemeral System	Rangeland	R030XY187CA
2%-Morongo, frequently flooded---	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
4260:			
45%-Minhoyt-----	Very Shallow Duripan Fan Remnants	Rangeland	R030XB220CA
40%-Corbilt, rarely flooded-----	Moderately Deep To Very Deep Loamy Fan Remnants	Rangeland	R030XB218CA
9%-Popups, cool-----	Loamy Fan Remnants And Pediments	Rangeland	R030XB221CA
5%-Minhoyt, sloping-----	Very Shallow Duripan Fan Remnants	Rangeland	R030XB220CA
4265:			
80%-Werewolf, warm-----	LIMY 3-5 P.Z.	Rangeland	R030XB019NV
7%-Werewolf-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
5%-Werewolf, warm, gently slopng--	LIMY 3-5 P.Z.	Rangeland	R030XB019NV
5%-Arizo, occasionally flooded---	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
3%-Arizo, rarely flooded-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
4270:			
95%-Yuccabutte, extremely cobbly sandy loam-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
5%-Cajon, occasionally flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
4271:			
60%-Yuccabutte, warm-----	Limy 5-7" p.z. (Low Production)	Rangeland	R030XB156CA
30%-Arizo, rarely flooded-----	Gravelly Outwash	Rangeland	R030XY159CA
4%-Cajon, occasionally flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1%-Yuccabutte, steep-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
4275:			
35%-Pinkcan-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
25%-Werewolf-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
15%-Gocougs, warm-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
8%-Arizo, rarely flooded-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
7%-Yuccabutte, dry-----	LIMY 3-5 P.Z.	Rangeland	R030XB019NV
5%-Gocougs, stable-----	Desert Pavement	Rangeland	R030XY002CA
3%-Joshua-----	Granitic Loam	Rangeland	R030XB137CA
2%-Gravesumit-----	Granitic Loam	Rangeland	R030XB137CA
4280:			
55%-Mekkadale-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA
25%-Edalph, warm-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA
10%-Edalph-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
8%-Cajon, rarely flooded-----	Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream	Rangeland	R030XY188CA
2%-Gocougs-----	Moderately Deep To Very Deep Loamy Fan Remnants	Rangeland	R030XB218CA
4285:			
35%-Typic Argidurids-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
30%-Coppermine-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA
25%-Minhoyt, warm-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
4%-Typic Argidurids, steep-----	Very Shallow To Moderately Deep Gravelly Slopes	Rangeland	R030XB193CA
1%-Arizo, occasionally flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
4403:			
50%-Arizo, rarely flooded, channeled-----	Flooded Gravelly Fans	Rangeland	R030XY038CA
25%-Arizo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
20%-Arizo-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
5%-Werewolf, stable-----	Desert Pavement	Rangeland	R030XY002CA
4440:			
55%-Dragonwash, occasionally flooded-----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
35%-Dragonwash, frequently flooded	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream	Rangeland	R030XY010CA
5%-Cajon, rarely flooded-----	Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream	Rangeland	R030XY188CA
4450:			
75%-Morongo, occasionally flooded	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
15%-Morongo, frequently flooded---	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
5%-Morongo, rarely flooded-----	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
3%-Morongo, very rarely flooded---	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
4605:			
80%-Pinecity, moist-----	Cool Shallow Fans Over Pediment	Rangeland	R030XB188CA
4%-Nasagold-----	Coarse Loamy Very Deep Fan Remnants	Rangeland	R030XB173CA
3%-Jumborox, dry-----	Loamy Very Deep Fan Remnants	Rangeland	R030XB183CA
2%-Morongo, very rarely flooded---	Sandy Fan Aprons	Rangeland	R030XB174CA
1%-Morongo, occasionally flooded--	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
4606:			
60%-Pinecity-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
5%-Desertqueen, cool-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
5%-Jumborox, warm-----	Coarse Loamy Very Deep Fan Remnants	Rangeland	R030XB173CA
5%-Morongo, very rarely flooded---	Sandy Fan Aprons	Rangeland	R030XB174CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
4607:			
85%-Pinecity-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
5%-Morongo, very rarely flooded---	Sandy Fan Aprons	Rangeland	R030XB174CA
5%-Pinecity, sloping-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
4608:			
60%-Pinecity-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
10%-Morongo, rarely flooded-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
4610:			
35%-Desertqueen-----	Cool Shallow Fans Over Pediment	Rangeland	R030XB188CA
25%-Jumborox, warm-----	Loamy Very Deep Fan Remnants	Rangeland	R030XB183CA
5%-Pinecity, cool-----	Bouldery Very Shallow To Shallow Gravelly Slopes	Rangeland	R030XB170CA
5%-Pinecity, moist-----	Cool Shallow Fans Over Pediment	Rangeland	R030XB188CA
3%-Littlefargo-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
3%-Morongo, occasionally flooded--	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
3%-Morongo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
1%-Ambrosia, cool-----	Loamy Very Deep Fan Remnants	Rangeland	R030XB183CA
4615:			
45%-Desertqueen, cool-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
25%-Jumborox-----	Cool Deep Sandy Fans	Rangeland	R030XB168CA
5%-Desertqueen, steep-----	Shallow Cool Hills	Rangeland	R030XB189CA
5%-Morongo, occasionally flooded--	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
5%-Pinecity-----	Dissected Pediment, Cool	Rangeland	R030XB166CA
4620:			
40%-Stranger-----	Warm Sloping Pediments	Rangeland	R030XB225CA
20%-Grubstake, moist-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
5%-Cajon, occasionally flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
4625:			
50%-Grinder-----	Loamy Fan Remnants And Pediments	Rangeland	R030XB221CA
20%-Grinder, cool-----	Warm Sloping Pediments	Rangeland	R030XB225CA
15%-Pinkcan, cool-----	Loamy Fan Remnants And Pediments	Rangeland	R030XB221CA



# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
4625:			
5%-Arizo, rarely flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
2%-Cajon, frequently flooded-----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
4630:			
50%-Thunderclap-----	Xeric Very Deep Sandy Fan Aprons On Pediments	Rangeland	R030XE200CA
30%-Smithcanyon-----	Sandy Xeric-Intergrade Slopes	Rangeland	R030XE196CA
8%-Smithcanyon, moderately steep--	Xeric Very Deep Sandy Fan Aprons On Pediments	Rangeland	R030XE200CA
5%-Stubbespring-----	Xeric Very Deep Sandy Fan Aprons On Pediments	Rangeland	R030XE200CA
2%-Thunderclap, rarely flooded----	Very Rarely To Rarely Flooded Thermic Ephemeral Stream	Rangeland	R030XY202CA
4804:			
25%-Ironped-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
20%-Pinecity-----	Shallow Cool Hills	Rangeland	R030XB189CA
5%-Littlefargo-----	Shallow Cool Hills	Rangeland	R030XB189CA
3%-Arizo, occasionally flooded----	Mid Size Thermic To Hyperthermic Ephemeral Stream	Rangeland	R030XY186CA
2%-Pinecity, cool-----	Bouldery Very Shallow To Shallow Gravelly Slopes	Rangeland	R030XB170CA
4805:			
30%-Ironped, cool-----	Dissected Pediment	Rangeland	R030XB171CA
12%-Lostpalms, cool-----	Dissected Pediment	Rangeland	R030XB171CA
5%-Morongo, warm-----	Dissected Pediment	Rangeland	R030XB171CA
3%-Morongo, frequently flooded----	Large, Sandy, Thermic, Ephemeral Stream	Rangeland	R030XY167CA
4806:			
5%-Pinecity, cool-----	Bouldery Very Shallow To Shallow Gravelly Slopes	Rangeland	R030XB170CA
5%-Pinecity, gravelly loamy sand--	Shallow Cool Hills	Rangeland	R030XB189CA
4811:			
10%-Pioneertown-----	Bouldery Very Shallow To Shallow Gravelly Slopes	Rangeland	R030XB170CA
5%-Dalvord, cool-----	Shallow Cool Hills	Rangeland	R030XB189CA
4825:			
20%-Grubstake-----	Warm Shallow Pediments	Rangeland	R030XB228CA
20%-Cajon, rarely flooded-----	LIMY 5-7 P.Z.	Rangeland	R030XB005NV
15%-Stranger, warm-----	Warm Shallow Pediments	Rangeland	R030XB228CA

# Soil Survey of Joshua Tree National Park, California

Table 4.-Ecological Site-Soil Correlation-Continued

Map unit symbol soil name and local phase, and percent of map unit	Ecological site name	Ecological site type	Ecological site ID
4825:			
5%-Ironped-----	Warm Shallow Pediments	Rangeland	R030XB228CA
5%-Lostpalms-----	Warm Shallow Pediments	Rangeland	R030XB228CA
5%-Grinder, warm-----	Warm Shallow Pediments	Rangeland	R030XB228CA
4830:			
10%-Pinecity, cool-----	Bouldery Very Shallow To Shallow Gravelly Slopes	Rangeland	R030XB170CA
5%-Blackeagle-----	Hyperthermic Steep South Slopes	Rangeland	R030XD003CA
3%-Stranger-----	Warm Sloping Pediments	Rangeland	R030XB225CA
2%-Grubstake, moist-----	Limy Hill 5-7" p.z.	Rangeland	R030XB140CA
4900:			
15%-Aguilareal-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
15%-Lostpalms-----	Warm Gravelly Shallow Hills	Rangeland	R030XB172CA
3%-Lostpalms, warm-----	Thermic Steep South Slopes	Rangeland	R030XB164CA
2%-Dalvord-----	Limy Hill 3-5" P.Z.	Rangeland	R030XB139CA

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities

(Range site composition is based on percent dry weight. Characteristic plants are pulled from the component existing plants table in the National Soils Information System (NASIS). Absence of an entry indicates the species totaled is less than one percent of annual production. Only soils and miscellaneous land types with correlated ecological sites are shown)

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1220: Jadestorm - 60%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	67
		Normal	240	creosote bush	10
		Unfavorable	155	pincushion flower	8
				California fagonbush	7
				desert Indianwheat	4
				cryptantha	1
				low woollygrass	1
				Schott's dalea	1
				white bursage	1
Blackeagle, cool - 20%-----	Low-Production Hyperthermic Hills (R030XD004CA)	Favorable	430	creosote bush	51
		Normal	150	desert Indianwheat	15
		Unfavorable	25	pincushion flower	12
				curvenut combseed	10
				sowthistle	10
				desertdandelion	
				cryptantha	2
1225: Blackeagle - 65%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	67
		Normal	240	creosote bush	10
		Unfavorable	155	pincushion flower	8
				California fagonbush	7
				desert Indianwheat	4
				cryptantha	1
				low woollygrass	1
				Schott's dalea	1
				white bursage	1
1230: Jadestorm - 45%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	67
		Normal	225	creosote bush	10
		Unfavorable	155	pincushion flower	8
				California fagonbush	7
				desert Indianwheat	4
				cryptantha	1
				low woollygrass	1
				Schott's dalea	1
				white bursage	1
Jadestorm, cool - 20%-----	Hyperthermic Dry Hills (R030XD001CA)	Favorable	431	creosote bush	62
		Normal	185	smooth desertdandelion	18
		Unfavorable	70	white bursage	10
				curvenut combseed	9
				desert Indianwheat	1
				cryptantha	
				Mediterranean grass	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1240:					
Meccapass - 45%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	70
		Normal	230	creosote bush	10
		Unfavorable	155	pincushion flower	9
				California fagonbush	7
				desert Indianwheat	4
				Phacelia	
				pincushion	
Bulletproof - 20%-----	Hyperthermic Steep North Slopes (R030XD040CA)	Favorable	435	white bursage	20
		Normal	225	Parish's goldeneye	18
		Unfavorable	145	annual forbs	15
				bastardsage	9
				brittlebush	8
				curvenut combseed	7
				creosote bush	5
				sweetbush	3
				brownplume wirelettuce	2
				Eastern Mojave buckwheat	2
				narrowleaf bedstraw	2
				smooth desertydandelion	2
				white ratany	2
				wishbone-bush	2
				desert trumpet	1
				Mojave woodyaster	1
				other shrubs	1
				red brome	
1241:					
Meccapass - 45%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	70
		Normal	230	creosote bush	10
		Unfavorable	155	pincushion flower	9
				California fagonbush	7
				desert Indianwheat	4
				Phacelia	
				pincushion	
Seanna - 20%----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	white bursage	28
		Normal	350	creosote bush	21
		Unfavorable	150	redstem stork's bill	12
				white ratany	9
				Mojave yucca	6
				jojoba	5
				desert globemallow	4
				big galleta	3
				desertsenna	3
				Nevada jointfir	3
				bristly fiddleneck	2
				curvenut combseed	1
				desert Indianwheat	1
				smooth desertydandelion	1
				sweetbush	1
				brittle spineflower	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1241: Contactmine, dry - 20%-----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	white bursage	28
		Normal	350	creosote bush	21
		Unfavorable	150	redstem stork's bill	12
				white ratany	9
				Mojave yucca	6
				jojoba	5
				desert globemallow	4
				big galleta	3
				desertsenna	3
				Nevada jointfir	3
				bristly fiddleneck	2
				curvenut combseed	1
				desert Indianwheat	1
				smooth desertdandelion	1
				sweetbush	1
				brittle spineflower	
1242: Meccapass - 40%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	70
		Normal	230	creosote bush	10
		Unfavorable	155	pincushion flower	9
				California fagonbush	7
				desert Indianwheat	4
				Phacelia	
				pincushion	
Jadestorm - 25%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	52
		Normal	160	creosote bush	37
		Unfavorable	155	desert lavender	5
				annual forbs	2
				buckwheat	1
				California fagonbush	1
				cryptantha	1
				four o'clock	1
				Hall's shrubby-spurge	
				trefoil	
				white bursage	
1250: Ironlung - 50%--	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	54
		Normal	205	creosote bush	13
		Unfavorable	155	white bursage	12
				annual forbs	3
				pincushion flower	3
				redstem stork's bill	3
				calthaleaf phacelia	2
				chia	2
				Eschscholzia poppy	2
				Schott's dalea	2
				smooth desertdandelion	2
				wishbone-bush	2

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1250: Ironlung, cool - 20%----	Hyperthermic Steep North Slopes (R030XD040CA)	Favorable Normal Unfavorable	435 220 145	Parish's goldeneye white bursage brittlebush Mojave woodyaster white ratany bastardsage wishbone-bush smooth desertdandelion sweetbush California fagonbush desert trumpet Eastern Mojave buckwheat creosote bush Mexican bladdersage desert needlegrass	19 18 14 13 10 5 5 4 4 2 2 2 1 1
1255: Goldenhills - 40%-----	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable Normal Unfavorable	305 240 155	brittlebush creosote bush pincushion flower California fagonbush desert Indianwheat cryptantha low woollygrass Schott's dalea white bursage	67 10 8 7 4 1 1 1 1
Bulletproof - 15%-----	Hyperthermic Steep North Slopes (R030XD040CA)	Favorable Normal Unfavorable	435 225 145	white bursage Parish's goldeneye annual forbs bastardsage brittlebush curvenut combseed creosote bush sweetbush brownplume wirelettuce Eastern Mojave buckwheat narrowleaf bedstraw smooth desertdandelion white ratany wishbone-bush desert trumpet Mojave woodyaster other shrubs red brome	20 18 15 9 8 7 5 3 2 2 2 2 2 1 1 1 1
Fanhill - 15%---	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable Normal Unfavorable	305 240 155	brittlebush creosote bush pincushion flower California fagonbush desert Indianwheat cryptantha low woollygrass Schott's dalea white bursage	67 10 8 7 4 1 1 1 1



# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities--Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1255:					
Whiterobe - 15%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	67
		Normal	240	creosote bush	10
		Unfavorable	155	pincushion flower	8
				California fagonbush	7
				desert Indianwheat	4
				cryptantha	1
				low woollygrass	1
				Schott's dalea	1
				white bursage	1
1260:					
Whiterobe - 45%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	67
		Normal	240	creosote bush	10
		Unfavorable	155	pincushion flower	8
				California fagonbush	7
				desert Indianwheat	4
				cryptantha	1
				low woollygrass	1
				Schott's dalea	1
				white bursage	1
Bigbernie - 20%	Moderately Deep Gravelly Mountain Slopes (R030XB213CA)	Favorable	395	California juniper	15
		Normal	345	bastardsage	14
		Unfavorable	112	green rabbitbrush	14
				wishbone-bush	12
				blackbrush	9
				Eastern Mojave buckwheat	8
				annual grasses	5
				annual forbs	5
				Mojave yucca	5
				Parish's goldeneye	5
				big galleta	3
				Mojave sage	3
				desert needlegrass	1
				Mojave woodyaster	1
				Parry's beargrass	
				red brome	
Whiterobe, cool - 15%-----	Hyperthermic Steep North Slopes (R030XD040CA)	Favorable	435	white bursage	20
		Normal	225	Parish's goldeneye	18
		Unfavorable	145	annual forbs	15
				bastardsage	9
				brittlebush	8
				curvenut combseed	7
				creosote bush	5
				sweetbush	3
				brownplume wirelettuce	2
				Eastern Mojave buckwheat	2
				narrowleaf bedstraw	2
				smooth desertdandelion	2
				white ratany	2
				wishbone-bush	2
				desert trumpet	1
				Mojave woodyaster	1
				other shrubs	1
				red brome	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1410: Missionwell - 50%-----	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable Normal Unfavorable	305 240 155	brittlebush creosote bush pincushion flower California fagonbush desert Indianwheat cryptantha low woollygrass Schott's dalea white bursage	67 10 8 7 4 1 1 1 1
Missionwell, high elevation - 15%	Hyperthermic Dry Hills (R030XD001CA)	Favorable Normal Unfavorable	431 220 70	creosote bush smooth desertdandelion desert Indianwheat white bursage pepperweed	59 28 9 4
1415: Bolero - 60%----	Hyperthermic Dry Hills (R030XD001CA)	Favorable Normal Unfavorable	431 350 70	curvenut combseed creosote bush desert Indianwheat cryptantha white bursage bristly fiddleneck brittlebush California barrel cactus sowthistle desertdandelion	82 11 4 2 1
1504: Rizzo, rarely flooded, stony - 50%----	Cobbly Fan Remnants (R031XY201CA)	Favorable Normal Unfavorable	225 160 60	creosote bush buckwheat chia California fagonbush lupine sowthistle desertdandelion purple threeawn California barrel cactus common Mediterranean grass beavertail pricklypear brittlebush curvenut combseed Engelmann's hedgehog cactus New Mexico silverbush	29 25 12 7 6 5 4 3 3 2 1 1 1 1

## Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
1504: Rizzo, occasionally flooded, stony - 35%----					
	Stony, Occasionally Flooded Ephemeral Stream (R031XY202CA)	Favorable	400	blue paloverde	66
		Normal	220	desert lavender	22
		Unfavorable	140	chia	3
				purple threeawn	3
				brownplume wirelettuce	2
				California barrel cactus	2
				Parry's false pararie-flower	1
				Schott's dalea	1
				bristly fiddleneck	
				buckwheat	
				common Mediterranean grass	
				curvenut combseed	
				red brome	
				sixweeks grama	
1510: Carizzo, very gravelly sandy loam - 85%-----					
	Hyperthermic Fans (R030XD015CA)	Favorable	291	creosote bush	80
		Normal	139	white bursage	15
		Unfavorable	75	white ratany	5
				buckwheat	
				devil's spineflower	
				Mediterranean grass	
				pricklypear	
				spurge	
1511: Carizzo, channeled - 75%					
	Flooded Gravelly Fans (R030XY038CA)	Favorable	765	curvenut combseed	65
		Normal	580	spineflower	11
		Unfavorable	60	creosote bush	8
				desertsenna	6
				cryptantha	3
				whitemargin sandmat	2
				bristly fiddleneck	1
				desert lavender	1
				Schott's dalea	1
				smooth desertdandelion	1
				white bursage	1
				buckwheat	
				chia	
				jojoba	
				Mediterranean grass	
				Mojave desertstar	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1511: Carrizo, occasionally flooded - 15%--	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)	Favorable Normal Unfavorable	395 261 40	creosote bush white bursage Schott's dalea brittlebush brownplume wirelettuce buckwheat California barrel cactus beavertail pricklypear desert Indianwheat sixweeks grama Wiggin's cholla	80 12 4 1 1 1 1
1512: Carrizo, extremely gravelly sandy loam - 80%----	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 139 75	creosote bush white bursage white ratany buckwheat devil's spineflower Mediterranean grass pricklypear spurge	80 15 5
1513: Carrizo - 60%---	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable Normal Unfavorable	190 70 20	creosote bush desert Indianwheat smooth desertdandelion cryptantha white bursage	85 5 5 4 1
Carrizo, occasionally flooded, channeled - 20%	Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)	Favorable Normal Unfavorable	615 450 280	catclaw acacia Asian Mustard bladderpod spiderflower burrobrush bristly fiddleneck desert almond curvenut combseed jojoba Mojave yucca white ratany coyote gourd creosote bush mistletoe redstem stork's bill sowthistle desertdandelion sweetbush wishbone-bush	29 18 18 10 4 4 3 3 2 2 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1513: Rubylee - 15%---	Desert Pavement (R030XY002CA)	Favorable	91	pincushion flower	48
		Normal	55	desert Indianwheat	24
		Unfavorable	10	creosote bush	20
				cryptantha	2
				desert marigold	2
				hairy desertsunflower	2
				smooth desertdandelion	2
				low woollygrass	
				Mediterranean grass	
				white bursage	
1514: Carrizo, rarely flooded - 40%--	Hyperthermic Fans (R030XD015CA)	Favorable	291	creosote bush	80
		Normal	139	white bursage	15
		Unfavorable	75	white ratany	5
				buckwheat	
				devil's spineflower	
				Mediterranean grass	
				pricklypear	
				spurge	
Pintobasin, fine sandy loam - 30%-----	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable	190	creosote bush	85
		Normal	70	desert Indianwheat	5
		Unfavorable	20	smooth desertdandelion	5
				cryptantha	4
				white bursage	1
Rubylee - 15%---	Desert Pavement (R030XY002CA)	Favorable	91	pincushion flower	48
		Normal	55	desert Indianwheat	24
		Unfavorable	10	creosote bush	20
				cryptantha	2
				desert marigold	2
				hairy desertsunflower	2
				smooth desertdandelion	2
				low woollygrass	
				Mediterranean grass	
				white bursage	
1515: Pintobasin - 80%	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable	190	creosote bush	85
		Normal	70	desert Indianwheat	5
		Unfavorable	20	smooth desertdandelion	5
				cryptantha	4
				white bursage	1
Carrizo, occasionally flooded - 15%--	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)	Favorable	395	creosote bush	80
		Normal	261	white bursage	12
		Unfavorable	40	Schott's dalea	4
				brittlebush	1
				brownplume wirelettuce	1
				buckwheat	1
				California barrel cactus	1
				beavertail pricklypear	
				desert Indianwheat	
				sixweeks grama	
				Wiggin's cholla	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1516: Pintobasin, fine sandy loam - 90%-----	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable Normal Unfavorable	190 170 20	desert Indianwheat suncup creosote bush hairy desertsunflower pincushion flower Mediterranean grass Panamint crptantha smooth desertdandelion white bursage	27 27 23 5 5 4 4 4 1
1517: Pintobasin - 65%	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable Normal Unfavorable	190 70 20	creosote bush desert Indianwheat smooth desertdandelion cryptantha white bursage	85 5 5 4 1
Dalelake - 25%--	Hyperthermic Sandsheets (R030XD025CA)	Favorable Normal Unfavorable	270 250 40	Asian Mustard common Mediterranean grass creosote bush white bursage big galleta	40 40  16 3 1
1520: Pintobasin, loamy sand - 80%-----	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 96 75	creosote bush pincushion flower smooth desertdandelion branched pencil cholla white bursage buckwheat	71 10 10 4 4 1
1522: Pintobasin, rarely flooded - 85%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 250 75	creosote bush pincushion sowthistle desertdandelion white bursage pincushion flower Asian Mustard bristly fiddleneck curvenut combseed desert Indianwheat devil's spineflower Mediterranean grass	56 23 16  4 1      



# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1523: Pintobasin, rarely flooded - 50%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 170 75	creosote bush white bursage cryptantha smooth desertdandelion white ratany big galleta desert Indianwheat pincushion flower small wirelettuce Wiggin's cholla	35 30 26 5 4
Aquapeak - 25%--	Desert Pavement (R030XY002CA)	Favorable Normal Unfavorable	91 55 10	creosote bush cryptantha sowthistle desertdandelion white bursage grass, perennial	35 20 20 15 10
Pintobasin, occasionally flooded - 20%--	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)	Favorable Normal Unfavorable	395 261 40	creosote bush white bursage Schott's dalea brittlebush brownplume wirelettuce buckwheat California barrel cactus beavertail pricklypear desert Indianwheat sixweeks grama Wiggin's cholla	80 12 4 1 1 1
1524: Pintobasin, rarely flooded - 90%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 211 75	cryptantha creosote bush white bursage smooth desertdandelion white ratany buckwheat annual forbs Mediterranean grass pincushion flower suncup	54 28 9 5 4

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities--Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
1525: Pintobasin, occasionally flooded - 45%--	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)	Favorable Normal Unfavorable	395 261 40	creosote bush white bursage Schott's dalea brittlebush brownplume wirelettuce buckwheat California barrel cactus beavertail pricklypear desert Indianwheat sixweeks grama Wiggin's cholla	80 12 4 1 1 1 1
Pintobasin, rarely flooded - 35%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 139 75	creosote bush desert Indianwheat white bursage white ratany cryptantha branched pencil cholla burrobrush Schott's dalea Wiggin's cholla	77 15 5 2 1
1526: Pintobasin, rarely flooded - 55%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 115 75	creosote bush white bursage Mediterranean grass Panamint crptantha Asian Mustard desert Indianwheat annual forbs pincushion flower	71 11 9 9
Joetree - 20%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 139 75	creosote bush white bursage big galleta sowthistle desertdandelion cryptantha desert Indianwheat gilia lupine	42 22 16 15 5
Patscamp - 15%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 139 75	creosote bush white bursage big galleta sowthistle desertdandelion cryptantha desert Indianwheat gilia lupine	42 22 16 15 5

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
1527: Pintobasin, moist - 90%----	Coarse Gravelly Fans (R030XD039CA)	Favorable Normal Unfavorable	318 220 120	brittlebush white bursage California barrel cactus creosote bush cryptantha teddybear cholla desert lavender sowthistle desertdandelion Wiggin's cholla annual grasses big galleta	62 14 9 8 2 2 1 1  1
1530: Dalelake, fine sand - 85%-----	Hyperthermic Sandsheets (R030XD025CA)	Favorable Normal Unfavorable	270 250 40	creosote bush Mediterranean grass smooth desertdandelion pincushion flower Panamint crptantha Asian Mustard evening-primrose	25 23 20 16 8 4 4
1531: Dalelake - 60%--	Hyperthermic Sandsheets (R030XD025CA)	Favorable Normal Unfavorable	270 140 40	creosote bush Asian Mustard desert Indianwheat Mediterranean grass big galleta cryptantha pincushion flower dyebush sowthistle desertdandelion white bursage bristly fiddleneck smooth desertdandelion	20 16 12 12 9 9 7 6 4  3 1 1
Pintobasin, rarely flooded - 30%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 170 75	creosote bush white bursage cryptantha smooth desertdandelion white ratany big galleta desert Indianwheat pincushion flower small wirelettuce Wiggin's cholla	35 30 26 5 4     

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
1540:					
Carrizo, very rarely flooded - 35%--	Coarse Gravelly Fans (R030XD039CA)	Favorable	318	cryptantha	53
		Normal	186	brittlebush	16
		Unfavorable	120	annual forbs	14
				creosote bush	9
				smooth desertdandelion	8
				beavertail pricklypear	
				catclaw acacia	
				desert Indianwheat	
Carrizo, stable - 25%---	Desert Pavement (R030XY002CA)	Favorable	91	sowthistle	69
		Normal	55	desertdandelion	
		Unfavorable	10	creosote bush	15
				brittlebush	10
				desert Indianwheat	5
				birdcage evening primrose	1
				desertholly	
Carrizo, occasionally flooded, rocky surface - 20%--	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream (R030XY021CA)	Favorable	225	brittlebush	31
		Normal	190	cryptantha	18
		Unfavorable	100	creosote bush	15
				Abrams' sandmat	10
				smooth desertdandelion	8
				white ratany	6
				desertholly	5
				sweetbush	4
				desert Indianwheat	3
				pepperweed	
Russiroks - 20%	Desert Pavement (R030XY002CA)	Favorable	91	smooth desertdandelion	55
		Normal	55	creosote bush	35
		Unfavorable	10	desert Indianwheat	10
1541:					
Carrizo, stable - 50%---	Desert Pavement (R030XY002CA)	Favorable	91	desert marigold	65
		Normal	55	desert Indianwheat	25
		Unfavorable	10	creosote bush	5
				annual forbs	5
Cambidic Haplodurids - 40%-----	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	Favorable	85	creosote bush	39
		Normal	40	sowthistle	23
		Unfavorable	20	desertdandelion	
				desert Indianwheat	15
				other annual forbs	13
				devil's spineflower	10
				cryptantha	
				Mojave desertstar	
				redroot cryptantha	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1542: Carrizo, very rarely flooded - 70%--	Coarse Gravelly Fans (R030XD039CA)	Favorable Normal Unfavorable	318 220 120	brittlebush white bursage California barrel cactus creosote bush cryptantha teddybear cholla desert lavender sowthistle desertdandelion Wiggin's cholla annual grasses big galleta	62 14 9 8 2 2 1 1 1 1
Carrizo, occasionally flooded - 20%--	Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)	Favorable Normal Unfavorable	342 100 96	burrobrush Schott's dalea smooth desertdandelion brittlebush sowthistle desertdandelion	52 22 10 8 8
1550: Buzzardsprings, stable - 35%---	Desert Pavement (R030XY002CA)	Favorable Normal Unfavorable	91 55 10	pincushion flower desert Indianwheat creosote bush cryptantha desert marigold hairy desertsunflower smooth desertdandelion low woollygrass Mediterranean grass white bursage	48 24 20 2 2 2 2
Coxpin - 25%----	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	Favorable Normal Unfavorable	85 80 20	cryptantha white bursage creosote bush Abrams' sandmat Asian Mustard brownplume wirelettuce common Mediterranean grass desert Indianwheat desert marigold lupine pincushion small wirelettuce	49 29 22

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
1550: Dalelake - 20%--	Hyperthermic Sandsheets (R030XD025CA)	Favorable	270	creosote bush	20
		Normal	140	Asian Mustard	16
		Unfavorable	40	desert Indianwheat	12
				Mediterranean grass	12
				big galleta	9
				cryptantha	9
				pincushion flower	7
				dyebush	6
				sowthistle	4
				desertdandelion	
				white bursage	3
				bristly fiddleneck	1
				smooth desertdandelion	1
1555: Goldrose - 35%--	Rarely Flooded Fans (R031XY200CA)	Favorable	396	sowthistle	35
		Normal	110	desertdandelion	
		Unfavorable	100	creosote bush	30
				brittlebush	19
				desert ironwood	13
				cryptantha	2
				buckwheat	1
				big galleta	
				blue paloverde	
				chia	
Carsitas, very rarely flooded - 30%--	Rarely Flooded Fans (R031XY200CA)	Favorable	396	creosote bush	52
		Normal	250	white bursage	16
		Unfavorable	100	brittlebush	11
				desert Indianwheat	11
				lupine	8
				cryptantha	1
				smooth desertdandelion	1
				annual grasses	
				Asian Mustard	
				pincushion flower	
Chemwash, rarely flooded - 25%--	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	Favorable	200	creosote bush	55
		Normal	145	brittlebush	22
		Unfavorable	99	sowthistle	11
				desertdandelion	
				white bursage	10
				cryptantha	1
				sweetbush	1
2003: Emptygun - 100%	Steep South Slope 2-4" p.z. (R031XY003CA)	Favorable	400	brittlebush	39
		Normal	250	creosote bush	25
		Unfavorable	100	cryptantha	11
				desert Indianwheat	8
				sowthistle	7
				desertdandelion	
				white ratany	4
				Parry's false	2
				pararie-flower	
				purple threeawn	2
				buckwheat	1
				devil's spineflower	1



# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2060:					
Joetree, very rarely flooded - 35%--	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable	190	creosote bush	85
		Normal	70	desert Indianwheat	5
		Unfavorable	20	smooth desertdandelion	5
				cryptantha	4
				white bursage	1
Dalelake - 30%--	Hyperthermic Sandsheets (R030XD025CA)	Favorable	270	creosote bush	20
		Normal	140	Asian Mustard	16
		Unfavorable	40	desert Indianwheat	12
				Mediterranean grass	12
				big galleta	9
				cryptantha	9
				pincushion flower	7
				dyebush	6
				sowthistle	4
				desertdandelion	
				white bursage	3
				bristly fiddleneck	1
				smooth desertdandelion	1
Pintobasin, fine sandy loam - 25%-----	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable	190	creosote bush	85
		Normal	70	desert Indianwheat	5
		Unfavorable	20	smooth desertdandelion	5
				cryptantha	4
				white bursage	1
2065:					
Dalelake - 30%--	Hyperthermic Sandsheets (R030XD025CA)	Favorable	270	creosote bush	20
		Normal	140	Asian Mustard	16
		Unfavorable	40	desert Indianwheat	12
				Mediterranean grass	12
				big galleta	9
				cryptantha	9
				pincushion flower	7
				dyebush	6
				sowthistle	4
				desertdandelion	
				white bursage	3
				bristly fiddleneck	1
				smooth desertdandelion	1
Aquapeak - 25%--	Desert Pavement (R030XY002CA)	Favorable	91	cryptantha	35
		Normal	55	creosote bush	20
		Unfavorable	10	sowthistle	20
				desertdandelion	
				grass, perennial	15
				white bursage	10
Coxpin - 25%----	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	Favorable	85	creosote bush	68
		Normal	45	white bursage	13
		Unfavorable	20	cryptantha	8
				smooth desertdandelion	6
				desert Indianwheat	3
				white ratany	2

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2067:					
Aquapeak, overblown - 30%	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	Favorable Normal Unfavorable	85 45 20	creosote bush white bursage cryptantha smooth desertdandelion desert Indianwheat white ratany	68 13 8 6 3 2
Buzzardsprings - 25%-----	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 139 75	creosote bush white bursage big galleta sowthistle desertdandelion cryptantha desert Indianwheat gilia lupine	42 22 16 15 5
Dalelake, thick sandy surface - 20%--	Hyperthermic Sandy Plains (R030XD014CA)	Favorable Normal Unfavorable	626 470 279	big galleta Asian Mustard Panamint crptantha Mediterranean grass creosote bush annual forbs birdcage evening primrose chuckwalla combseed desert Indianwheat pincushion flower smooth desertdandelion	33 29 12 10 9 3 1 1 1 1
Buzzardsprings, steep - 15%----	Hyperthermic Dry Hills (R030XD001CA)	Favorable Normal Unfavorable	431 255 70	curvenut combseed creosote bush smooth desertdandelion water jacket white bursage desert Indianwheat cryptantha brittlebush	36 35 11 6 5 4 2 1
2068:					
Aquapeak - 45%--	Desert Pavement (R030XY002CA)	Favorable Normal Unfavorable	91 55 10	pincushion flower desert Indianwheat creosote bush cryptantha hairy desertsunflower Mediterranean grass	68 17 15

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2068:					
Carpetflat, nongravelly surface - 35%--	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	Favorable Normal Unfavorable	85 45 20	creosote bush white bursage cryptantha smooth desertdandelion desert Indianwheat white ratany	68 13 8 6 3 2
Pintobasin - 15%	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable Normal Unfavorable	190 70 20	creosote bush desert Indianwheat smooth desertdandelion cryptantha white bursage	85 5 5 4 1
2070:					
Missionsweet - 60%-----	Low-Production Hyperthermic Hills (R030XD004CA)	Favorable Normal Unfavorable	430 150 25	creosote bush desert Indianwheat pincushion flower curvenut combseed sowthistle desertdandelion cryptantha	51 15 12 10 10 2
Carpetflat - 25%	Desert Pavement (R030XY002CA)	Favorable Normal Unfavorable	91 55 10	pincushion flower desert Indianwheat creosote bush cryptantha desert marigold hairy desertsunflower smooth desertdandelion low woollygrass Mediterranean grass white bursage	48 24 20 2 2 2 2
2075:					
Oldale - 50%----	Desert Pavement (R030XY002CA)	Favorable Normal Unfavorable	91 55 10	pincushion flower desert Indianwheat creosote bush cryptantha desert marigold hairy desertsunflower smooth desertdandelion low woollygrass Mediterranean grass white bursage	48 24 20 2 2 2 2
Missionsweet - 30%-----	Low-Production Hyperthermic Hills (R030XD004CA)	Favorable Normal Unfavorable	430 150 25	creosote bush desert Indianwheat pincushion flower curvenut combseed sowthistle desertdandelion cryptantha	51 15 12 10 10 2

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2076:					
Oldale - 40%----	Desert Pavement (R030XY002CA)	Favorable	91	pincushion flower	48
		Normal	55	desert Indianwheat	24
		Unfavorable	10	creosote bush	20
				cryptantha	2
				desert marigold	2
				hairy desertsunflower	2
				smooth desertdandelion	2
				low woollygrass	
				Mediterranean grass	
				white bursage	
Carrizo - 30%----	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable	190	creosote bush	85
		Normal	70	desert Indianwheat	5
		Unfavorable	20	smooth desertdandelion	5
				cryptantha	4
				white bursage	1
2077:					
Oldale - 50%----	Desert Pavement (R030XY002CA)	Favorable	91	pincushion flower	48
		Normal	55	desert Indianwheat	24
		Unfavorable	10	creosote bush	20
				cryptantha	2
				desert marigold	2
				hairy desertsunflower	2
				smooth desertdandelion	2
				low woollygrass	
				Mediterranean grass	
				white bursage	
Carrizo - 25%----	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable	190	creosote bush	85
		Normal	70	desert Indianwheat	5
		Unfavorable	20	smooth desertdandelion	5
				cryptantha	4
				white bursage	1
Carrizo, very rarely flooded - 15%--	Coarse Gravelly Fans (R030XD039CA)	Favorable	318	creosote bush	47
		Normal	186	sowthistle	23
		Unfavorable	120	desertdandelion	
				brittlebush	20
				cryptantha	9
				Asian Mustard	1
2085:					
Rainbowsend - 45%-----	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	67
		Normal	240	creosote bush	10
		Unfavorable	155	pincushion flower	8
				California fagonbush	7
				desert Indianwheat	4
				cryptantha	1
				low woollygrass	1
				Schott's dalea	1
				white bursage	1

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2085:					
Goldenbell - 35%	Desert Pavement (R030XY002CA)	Favorable	91	pincushion flower	48
		Normal	55	desert Indianwheat	24
		Unfavorable	10	creosote bush	20
				cryptantha	2
				desert marigold	2
				hairy desertsunflower	2
				smooth desertdandelion	2
				low woollygrass	
				Mediterranean grass	
				white bursage	
2090:					
Deprave - 35%---	Desert Pavement 2-4" p.z. (R031XY002CA)	Favorable	125	brittlebush	35
		Normal	50	creosote bush	35
		Unfavorable	25	sowthistle	15
				desertdandelion	
				desert Indianwheat	10
				Parry's false	5
				pararie-flower	
Rockhound - 25%	Desert Pavement 2-4" p.z. (R031XY002CA)	Favorable	125	creosote bush	40
		Normal	50	brittlebush	30
		Unfavorable	25	desert Indianwheat	10
				sowthistle	10
				desertdandelion	
				Schott's dalea	5
				teddybear cholla	5
				blue paloverde	
Rizzo - 20%----	Gravelly Fan Remnants And Fan Aprons (R031XY009CA)	Favorable	344	creosote bush	51
		Normal	160	sowthistle	15
		Unfavorable	50	desertdandelion	
				Schott's dalea	14
				desert Indianwheat	11
				cushion foxtail cactus	7
				brittlebush	2
				paleface	
2091:					
Deprave - 60%---	Desert Pavement 2-4" p.z. (R031XY002CA)	Favorable	125	brittlebush	35
		Normal	50	creosote bush	35
		Unfavorable	25	sowthistle	15
				desertdandelion	
				desert Indianwheat	10
				Parry's false	5
				pararie-flower	
Roostertail - 15%-----	Limy 2-4" p.z. (R031XY006CA)	Favorable	100	creosote bush	74
		Normal	50	white ratany	12
		Unfavorable	25	other shrubs	7
				desert Indianwheat	4
				white bursage	3
				big galleta	
				sixweeks threeawn	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2100:					
Perurose - 50%--	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	Favorable Normal Unfavorable	85 25 20	creosote bush white ratany white bursage branched pencil cholla cane bluestem cryptantha desert Indianwheat annual forbs low woollygrass smooth desertdandelion	69 23 8
Coxpin - 25%---	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	Favorable Normal Unfavorable	85 25 20	creosote bush big galleta Asian Mustard desert trumpet desert palafox	45 30 10 10 5
Pintobasin, gravelly surface - 15%--	Hyperthermic Shallow Fan Moderately Deep Fan Remnants (R030XD042CA)	Favorable Normal Unfavorable	85 45 20	creosote bush white bursage cryptantha smooth desertdandelion desert Indianwheat white ratany	68 13 8 6 3 2
2101:					
Perurose, rarely flooded - 60%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 139 75	creosote bush white bursage big galleta sowthistle desertdandelion cryptantha desert Indianwheat gilia lupine	42 22 16 15 5
Pintobasin, rarely flooded - 35%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 139 75	creosote bush white bursage big galleta desert Indianwheat popcornflower cryptantha desert palafox manybristle cinchweed white ratany	60 20 10 5 5
2110:					
Descent - 80%---	Low-Production Hyperthermic Hills (R030XD004CA)	Favorable Normal Unfavorable	430 150 25	desert Indianwheat sowthistle desertdandelion creosote bush annual forbs	35 35 30



# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2110: Descent, stable - 15%---	Desert Pavement (R030XY002CA)	Favorable Normal Unfavorable	91 55 10	pincushion flower desert Indianwheat creosote bush cryptantha desert marigold hairy desertsunflower smooth desertdandelion low woollygrass Mediterranean grass white bursage	48 24 20 2 2 2 2
2111: Descent, warm - 45%-----	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable Normal Unfavorable	305 160 155	brittlebush desert Indianwheat California fagonbush cryptantha lupine sowthistle desertdandelion	50 40 7 3
Rubylee, very rarely flooded - 40%--	Coarse Gravelly Fans (R030XD039CA)	Favorable Normal Unfavorable	318 125 120	cryptantha brittlebush annual forbs creosote bush smooth desertdandelion desert Indianwheat California fagonbush suncup	50 16 14 9 8 3
2120: Rizzo, rarely flooded - 35%--	Rarely Flooded Fans (R031XY200CA)	Favorable Normal Unfavorable	396 100 100	cryptantha brittlebush creosote bush sowthistle desertdandelion birdcage evening primrose brittle spineflower desert Indianwheat annual forbs	80 10 6 4
Deprave - 35%---	Desert Pavement 2-4" p.z. (R031XY002CA)	Favorable Normal Unfavorable	125 50 25	creosote bush brittlebush white ratany other annual forbs other shrubs white bursage annual grasses desert Indianwheat big galleta desert trumpet ocotillo Parry's false pararie-flower Schott's dalea	68 10 4 3 3 3 2 2 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
2120: Rizzo, frequently flooded - 20%--	Frequently Flooded, Confined Ephemeral Stream (R031XY029CA)	Favorable Normal Unfavorable	525 365 133	creosote bush cryptantha desert ironwood sowthistle desertdandelion Asian Mustard white ratany big galleta desert Indianwheat buckwheat	49 18 10 8  7 4 2 2
2121: Rizzo, rubbly - 90%-----	Extremely Stony Fan Remnants (R031XY030CA)	Favorable Normal Unfavorable	455 290 150	creosote bush teddybear cholla California barrel cactus chia paleface California fagonbush Parry's false pararie-flower brittlebush buckwheat fiddleneck littleleaf ratany sowthistle desertdandelion sweetbush desert ironwood New Mexico silverbush ocotillo purple threeawn sixweeks grama	39 24 12 9 5 3 2  1 1 1 1 1 1 1 1 1 1 1 1 1
2130: Goldenbell - 55%	Desert Pavement (R030XY002CA)	Favorable Normal Unfavorable	91 55 10	cryptantha desert Indianwheat low woollygrass smooth desertdandelion	25 25 25 25
Descent - 40%---	Low-Production Hyperthermic Hills (R030XD004CA)	Favorable Normal Unfavorable	430 170 25	creosote bush sowthistle desertdandelion desert Indianwheat cryptantha	51 42  5 2

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2140: Rockhound, cobbly - 85%---	Cobbly Fan Remnants (R031XY201CA)	Favorable Normal Unfavorable	225 160 60	creosote bush buckwheat chia California fagonbush lupine sowthistle desertdandelion purple threeawn California barrel cactus common Mediterranean grass beavertail pricklypear brittlebush curvenut combseed Engelmann's hedgehog cactus New Mexico silverbush	29 25 12 7 6 5  4 3 3  2 1 1 1  1
2402: Rizzo - 70%-----	Gravelly Fan Remnants And Fan Aprons (R031XY009CA)	Favorable Normal Unfavorable	344 200 50	creosote bush brittlebush pincushion flower sandmat brittle spineflower California fagonbush desert Indianwheat buckwheat lupine ocotillo white bursage Wiggin's cholla sixweeks threeawn smooth desertdandelion trefoil	32 22 14 9 5 5 5 2 2 2 1 1  1
Rizzo, frequently flooded - 20%--	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	Favorable Normal Unfavorable	774 80 80	desert lavender burrobrush sweetbush smoketree blue paloverde ghost flower smooth desertdandelion	32 31 21 16   
2403: Rizzo - 80%-----	Gravelly Fan Remnants And Fan Aprons (R031XY009CA)	Favorable Normal Unfavorable	344 80 50	creosote bush Schott's dalea sowthistle desertdandelion desert Indianwheat purple threeawn white bursage	50 21 20  9  

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2403: Rizzo, occasionally flooded - 15%--	Coarse Gravelly Wash (R031XY019CA)	Favorable Normal Unfavorable	1000 900 750	brittlebush catclaw acacia creosote bush desert lavender big galleta blue paloverde burrobrush New Mexico silverbush Schott's dalea sweetbush water jacket white bursage white ratany whitemargin sandmat	34 30 23 8 1 1 1 1 1 1
2404: Rizzo, occasionally flooded - 60%--	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	Favorable Normal Unfavorable	200 145 99	burrobrush blue paloverde Schott's dalea desert lavender brittlebush cryptantha	58 21 12 8 1
Rizzo, very rarely flooded - 35%--	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	Favorable Normal Unfavorable	200 145 99	creosote bush brittlebush sowthistle desertdandelion white bursage cryptantha sweetbush	55 22 11 10 1 1
2405: Carrizo, rarely flooded - 65%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 139 75	creosote bush white bursage white ratany buckwheat devil's spineflower Mediterranean grass pricklypear spurge	80 15 5

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

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# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2406: Carrizo, occasionally flooded - 40%--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	Favorable Normal Unfavorable	881 175 60	burrobrush creosote bush smooth desertdandelion catclaw acacia other annual forbs cryptantha Schott's dalea hairy milkweed bristly fiddleneck Wiggin's cholla bladderpod spiderflower buckwheat chia curvenut combseed distant phacelia pincushion flower redstem stork's bill small wirelettuce sweetbush	28 22 22 13 5 3 3 2 1 1
2407: Pintobasin, rarely flooded - 45%--	Hyperthermic Fans (R030XD015CA)	Favorable Normal Unfavorable	291 170 75	creosote bush white bursage cryptantha smooth desertdandelion white ratany big galleta desert Indianwheat pincushion flower small wirelettuce Wiggin's cholla	35 30 26 5 4
Carrizo, occasionally flooded - 30%--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	Favorable Normal Unfavorable	881 175 60	burrobrush creosote bush smooth desertdandelion catclaw acacia other annual forbs cryptantha Schott's dalea hairy milkweed bristly fiddleneck Wiggin's cholla bladderpod spiderflower buckwheat chia curvenut combseed distant phacelia pincushion flower redstem stork's bill small wirelettuce sweetbush	28 22 22 13 5 3 3 2 1 1



# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2407: Carrizo, frequently flooded - 20%--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	Favorable Normal Unfavorable	881 140 60	smoketree burrobrush annual forbs hairy milkweed branched pencil cholla bladderpod spiderflower brittle spineflower Wiggin's cholla catclaw acacia buckwheat chia cryptantha Mediterranean grass pincushion flower purplemat redstem stork's bill smooth desertdandelion western tansymustard	43 14 13 13 7 5 2 2 1
2408: Rizzo, frequently flooded - 55%--	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	Favorable Normal Unfavorable	774 180 80	burrobrush desert ironwood pygmy poppy blue paloverde distant phacelia desert lavender bristly fiddleneck catclaw acacia sweetbush brownplume wirelettuce other annual forbs smoketree smooth desertdandelion	23 19 19 12 11 10 3 2 1
Rizzo, very rarely flooded - 35%--	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	Favorable Normal Unfavorable	774 190 80	brittlebush Schott's dalea creosote bush wishbone-bush desert lavender branched pencil cholla blue paloverde cryptantha distant phacelia Mediterranean grass smooth desertdandelion white bursage	56 14 11 7 4 2 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2409: Rizzo, frequently flooded - 35%--	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	Favorable Normal Unfavorable	774 80 80	burrobrush desert ironwood pygmy poppy blue paloverde distant phacelia desert lavender bristly fiddleneck catclaw acacia sweetbush brownplume wirelettuce other annual forbs smoketree smooth desertdandelion	23 19 19 12 11 10 3 2 1
Chemwash, frequently flooded - 30%--	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	Favorable Normal Unfavorable	774 120 80	smoketree burrobrush buckwheat chia desert lavender sweetbush	76 20 1 1 1 1
Carsitas, occasionally flooded, braided - 25%--	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	Favorable Normal Unfavorable	200 145 99	burrobrush brittlebush buckwheat chia Parry's wirelettuce redstem stork's bill bladderpod spiderflower blue paloverde brittle spineflower curvenut combseed desert ironwood	66 30 1 1 1 1
2420: Carsitas, frequently flooded - 45%--	Valley Wash (R031XY010CA)	Favorable Normal Unfavorable	1070 618 191	desert willow blue paloverde Asian Mustard smoketree burrobrush common Mediterranean grass smooth desertdandelion desert Indianwheat annual forbs Panamint crptantha Parish's goldeneye pincushion flower sowthistle desertdandelion	36 30 22 6 3 2 1

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2420: Carsitas, occasionally flooded - 40%--	Valley Wash (R031XY010CA)	Favorable	1070	blue paloverde	76
		Normal	618	Schott's dalea	17
		Unfavorable	191	burrobrush	4
				creosote bush	2
				desert lavender	1
				Asian Mustard	
				distant phacelia	
				annual forbs	
				purple threeawn	
				pygmy poppy	
Carsitas, rarely flooded - 15%--	Coarse Gravelly Wash (R031XY019CA)	Favorable	1000	brittlebush	34
		Normal	900	catclaw acacia	30
		Unfavorable	750	creosote bush	23
				desert lavender	8
				big galleta	1
				blue paloverde	1
				burrobrush	1
				New Mexico silverbush	1
				Schott's dalea	1
				sweetbush	
				water jacket	
				white bursage	
				white ratany	
				whitemargin sandmat	
2421: Carsitas, very rarely flooded - 55%--	Rarely Flooded Fans (R031XY200CA)	Favorable	396	creosote bush	52
		Normal	250	white bursage	16
		Unfavorable	100	brittlebush	11
				desert Indianwheat	11
				lupine	8
				cryptantha	1
				smooth desertdandelion	1
				annual grasses	
				Asian Mustard	
				pincushion flower	
Carsitas, rarely flooded - 25%--	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	Favorable	200	brittlebush	58
		Normal	145	Schott's dalea	16
		Unfavorable	99	creosote bush	12
				burrobrush	5
				cryptantha	4
				desert lavender	2
				blue paloverde	1
				chia	1
				curvenut combseed	1
				brittle spineflower	
				buckwheat	
				Mediterranean grass	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percentage of map	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2431: Chemwash, frequently flooded, braided - 60%--	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	Favorable Normal Unfavorable	200 145 99	burrobrush desert lavender brittlebush chia cryptantha annual forbs hairy milkweed Parry's wirelettuce smooth desertdandelion buckwheat redstem stork's bill suncup	44 35 15 1 1 1 1 1 1 1
Chemwash, frequently flooded - 25%--	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	Favorable Normal Unfavorable	774 120 80	smoketree burrobrush buckwheat chia desert lavender sweetbush	76 20 1 1 1 1
2440: Rizzo - 35%----	Gravelly Fan Remnants And Fan Aprons (R031XY009CA)	Favorable Normal Unfavorable	344 160 50	creosote bush sowthistle desertdandelion Schott's dalea desert Indianwheat cushion foxtail cactus brittlebush paleface	51 15 14 11 7 2
Rizzo, occasionally flooded - 30%--	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	Favorable Normal Unfavorable	200 145 99	desert lavender brittlebush fiddleneck sweetbush cryptantha blue paloverde chia desert globemallow California fagonbush creosote bush Schott's pygmycedar lupine ocotillo	26 23 22 10 7 4 3 2 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2440: Rizzo, extremely stony - 15%----	Extremely Stony Fan Remnants (R031XY030CA)	Favorable	455	creosote bush	39
		Normal	290	teddybear cholla	24
		Unfavorable	150	California barrel cactus	12
				chia	9
				paleface	5
				California fagonbush	3
				Parry's false	2
				pararie-flower	
				brittlebush	1
				buckwheat	1
				fiddleneck	1
				littleleaf ratany	1
				sowthistle	1
				desertdandelion	
				sweetbush	1
				desert ironwood	
				New Mexico silverbush	
				ocotillo	
				purple threeawn	
				sixweeks grama	
2715: Dalelake - 35%--	Hyperthermic Sandsheets (R030XD025CA)	Favorable	270	Asian Mustard	43
		Normal	120	big galleta	24
		Unfavorable	40	creosote bush	24
				sowthistle	6
				desertdandelion	
				white bursage	3
				bristly fiddleneck	
				buckwheat	
				cryptantha	
				dyebush	
Sheephole - 30%	Hyperthermic Sandy Plains (R030XD014CA)	Favorable	626	Asian Mustard	59
		Normal	600	Panamint crptantha	12
		Unfavorable	279	Mediterranean grass	10
				creosote bush	9
				annual forbs	3
				big galleta	2
				birdcage evening primrose	1
				chuckwalla combseed	1
				desert Indianwheat	1
				Great Basin langloisia	1
				pincushion flower	1
				desert needlegrass	
				smooth desertdandelion	
Pintobasin - 25%	Dry Deep Sandy Fan Aprons (R030XD006CA)	Favorable	190	Asian Mustard	45
		Normal	75	creosote bush	39
		Unfavorable	20	cryptantha	15
				annual forbs	1

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
2716: Dalelake, steep - 75%----	Hyperthermic Sandhill (R030XD008CA)	Favorable	905	big galleta	57
		Normal	562	Asian Mustard	27
		Unfavorable	250	creosote bush	6
				white bursage	4
				California croton	2
				dyebush	2
				annual forbs	1
				white ratany	1
				birdcage evening primrose	
				desert palafox	
Dalelake - 20%--	Hyperthermic Sandsheets (R030XD025CA)	Favorable	270	creosote bush	20
		Normal	140	Asian Mustard	16
		Unfavorable	40	desert Indianwheat	12
				Mediterranean grass	12
				big galleta	9
				cryptantha	9
				pincushion flower	7
				dyebush	6
				sowthistle	4
				desertdandelion	
				white bursage	3
				bristly fiddleneck	1
				smooth desertdandelion	1
2717: Dalelake - 40%--	Hyperthermic Sandhill (R030XD008CA)	Favorable	905	big galleta	57
		Normal	562	Asian Mustard	27
		Unfavorable	250	creosote bush	6
				white bursage	4
				California croton	2
				dyebush	2
				annual forbs	1
				white ratany	1
				birdcage evening primrose	
				desert palafox	
Buzzardsprings, fine sand - 20%	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	Favorable	85	creosote bush	68
		Normal	45	white bursage	13
		Unfavorable	20	cryptantha	8
				smooth desertdandelion	6
				desert Indianwheat	3
				white ratany	2
2718: Dalelake - 55%--	Hyperthermic Sandsheets (R030XD025CA)	Favorable	270	cryptantha	55
		Normal	75	desert Indianwheat	24
		Unfavorable	40	creosote bush	13
				Mediterranean grass	3
				white bursage	3
				pincushion flower	2
				Asian Mustard	
				blazingstar	
				branched pencil cholla	
				desert calico	
				dyebush	
				annual forbs	
				redroot cryptantha	
				sowthistle	
				desertdandelion	



# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2718: Sheephole, gravelly surface - 45%--	Hyperthermic Sandsheets (R030XD025CA)	Favorable Normal Unfavorable	270 100 40	creosote bush cryptantha dyebush sowthistle desertdandelion bristly fiddleneck white bursage birdcage evening primrose desert Indianwheat Mediterranean grass suncup	36 33 16 10  4 1      
2820: Impedimenta - 25%-----	Hyperthermic Dissected Shallow Pediment (R030XD023CA)	Favorable Normal Unfavorable	225 140 68	Mojave indigobush desert Indianwheat Asian Mustard desertsenna littleleaf ratany pincushion flower creosote bush desert trumpet brittle spineflower common Mediterranean grass distant phacelia Mojave woodyaster other annual forbs white ratany Nevada jointfir Parish's goldeneye water jacket white bursage California fagonbush dyebush Nevada dalea	19 16 15 12 8 7 4 3 2 2  2 2 2 2 1 1 1 1   
2825: Supplymine - 25%	Low-Production Hyperthermic Hills (R030XD004CA)	Favorable Normal Unfavorable	430 150 25	creosote bush desert Indianwheat pincushion flower curvenut combseed sowthistle desertdandelion cryptantha	51 15 12 10 10  2
Bolero, dry - 15%-----	Low-Production Hyperthermic Hills (R030XD004CA)	Favorable Normal Unfavorable	430 150 25	creosote bush desert Indianwheat pincushion flower curvenut combseed sowthistle desertdandelion cryptantha	51 15 12 10 10  2

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
2825: Ironage - 15%---	Low-Production Hyperthermic Hills (R030XD004CA)	Favorable Normal Unfavorable	430 150 25	creosote bush desert Indianwheat pincushion flower curvenut combseed sowthistle desertdandelion cryptantha	51 15 12 10 10 2
2830: Blackeagle, cool - 10%----	Low-Production Hyperthermic Hills (R030XD004CA)	Favorable Normal Unfavorable	430 150 25	creosote bush desert Indianwheat pincushion flower curvenut combseed sowthistle desertdandelion cryptantha	51 15 12 10 10 2
2835: Blackeagle - 40%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable Normal Unfavorable	305 240 155	brittlebush creosote bush pincushion flower California fagonbush desert Indianwheat cryptantha low woollygrass Schott's dalea white bursage	67 10 8 7 4 1 1 1 1
2840: Jadestorm - 30%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable Normal Unfavorable	305 240 155	creosote bush brittlebush	81 19
3110: Coppermine, cool - 40%----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable Normal Unfavorable	450 325 150	big galleta jojoba Mojave yucca pincushion flower Eastern Mojave buckwheat desert globemallow Mojave woodyaster Parry's wirelettuce Hall's shrubby-spurge creosote bush Nevada jointfir white bursage California fagonbush annual grasses cryptantha curvenut combseed desert needlegrass white ratany	28 13 11 9 8 7 7 7 3 2 2 2 1

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3110: Stranger - 30%--	Warm Sloping Pediments (R030XB225CA)	Favorable	530	pincushion flower	22
		Normal	240	Hall's shrubby-spurge	20
		Unfavorable	230	Mojave yucca	14
				Eastern Mojave buckwheat	6
				jojoba	6
				curvenut combseed	5
				Nevada jointfir	5
				Parish's goldeneye	5
				white bursage	5
				littleleaf ratany	4
				branched pencil cholla	3
				Wiggin's cholla	3
				desert globemallow	1
				redstem stork's bill	1
				cryptantha	
				desert needlegrass	
				Parry's wirelettuce	
3120: Aguilareal - 40%	Warm Gravelly Shallow Hills (R030XB172CA)	Favorable	442	Parish's goldeneye	29
		Normal	246	creosote bush	22
		Unfavorable	105	Eastern Mojave buckwheat	6
				Nevada jointfir	6
				redstem stork's bill	6
				catclaw acacia	4
				desert trumpet	4
				white bursage	4
				Hall's shrubby-spurge	3
				wishbone-bush	3
				bristly fiddleneck	2
				littleleaf ratany	2
				big galleta	1
				chia	1
				desert globemallow	1
				desert needlegrass	1
				jojoba	1
				Mojave yucca	1
				red brome	1
				water jacket	1
				white ratany	1
				cryptantha	
Blackeagle - 20%	Hyperthermic Steep South Slopes (R030XD003CA)	Favorable	305	brittlebush	67
		Normal	240	creosote bush	10
		Unfavorable	155	pincushion flower	8
				California fagonbush	7
				desert Indianwheat	4
				cryptantha	1
				low woollygrass	1
				Schott's dalea	1
				white bursage	1

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3213:					
Dalvord - 35%---	Limy Hill 3-5" P.Z. (R030XB139CA)	Favorable	350	creosote bush	51
		Normal	225	redstem stork's bill	23
		Unfavorable	50	bristly fiddleneck	9
				annual forbs	5
				white bursage	3
				desert globemallow	2
				chia	1
				jojoba	1
				Mojave yucca	1
				Nevada jointfir	1
				red brome	1
				white ratany	1
				wishbone-bush	1
Aguilareal - 30%	Warm Gravelly Shallow Hills (R030XB172CA)	Favorable	442	Hall's shrubby-spurge	19
		Normal	246	redstem stork's bill	16
		Unfavorable	105	white bursage	13
				desert trumpet	12
				brittlebush	6
				creosote bush	6
				Parish's goldeneye	5
				wishbone-bush	5
				big galleta	4
				desert globemallow	3
				Eastern Mojave buckwheat	3
				Engelmann's hedgehog	2
				cactus	
				littleleaf ratany	2
				shrubby deervetch	2
				Nevada jointfir	1
				sweetbush	1
3242:					
Langwell - 50%--	Warm Sloping Pediments (R030XB225CA)	Favorable	530	white bursage	23
		Normal	340	redstem stork's bill	21
		Unfavorable	230	Hall's shrubby-spurge	9
				Nevada jointfir	8
				Parish's goldeneye	8
				cottontop cactus	7
				Mojave woodyaster	6
				littleleaf ratany	4
				Engelmann's hedgehog	3
				cactus	
				jojoba	2
				Mojave yucca	2
				branched pencil cholla	1
				California juniper	1
				creosote bush	1
				Eastern Mojave buckwheat	1
				narrowleaf bedstraw	1
				Parry's beargrass	1
				white ratany	1
				Mediterranean grass	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3242: Helendale, cool - 20%----	Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)	Favorable Normal Unfavorable	920 722 124	bristly fiddleneck red brome white bursage chia redstem stork's bill big galleta branched pencil cholla Hall's shrubby-spurge jojoba Mojave yucca creosote bush cryptantha grape soda lupine pincushion flower	25 24 18 14 13 2 1 1 1 1 1 1 1 1 1
3285: Pinecity - 30%--	Shallow Cool Hills (R030XB189CA)	Favorable Normal Unfavorable	690 373 170	Parish's goldeneye blackbrush Virgin River brittlebush redstem stork's bill desert needlegrass California juniper red brome desert globemallow Mojave yucca Nevada jointfir sweetbush water jacket Acton's brittlebush Eastern Mojave buckwheat Engelmann's hedgehog cactus narrowleaf goldenbush shrubby deervetch wishbone-bush California jointfir	38 11 9 8 6 5 4 3 3 3 2 2 1 1 1 1 1 1 1 1
Contactmine - 20%-----	Shallow Cool Hills (R030XB189CA)	Favorable Normal Unfavorable	690 270 170	Mojave yucca blackbrush needle grama Nevada jointfir bristly fiddleneck redstem stork's bill sixweeks grama whitemargin sandmat Parish's goldeneye white ratany water jacket white bursage big galleta creosote bush desert needlegrass Wiggin's cholla	38 22 7 6 4 4 4 4 3 3 2 2 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3285: Desertqueen - 20%-----	Shallow Cool Hills (R030XB189CA)	Favorable	690	blackbrush	55
		Normal	200	Parish's goldeneye	14
		Unfavorable	170	California juniper	12
				Eastern Mojave buckwheat	7
				Nevada jointfir	5
				desert globemallow	2
				big galleta	1
				desert needlegrass	1
				Mojave yucca	1
				redstem stork's bill	1
				water jacket	1
				green rabbitbrush	
				Mexican bladdersage	
				Parry's beargrass	
				red brome	
				threadleaf snakeweed	
3286: Pinecity, gravelly loamy sand - 85%-----	Shallow Cool Hills (R030XB189CA)	Favorable	690	red brome	46
		Normal	548	narrowleaf goldenbush	12
		Unfavorable	170	blackbrush	10
				Mexican bladdersage	9
				desert globemallow	8
				California juniper	7
				bristly fiddleneck	2
				redstem stork's bill	2
				Sandberg bluegrass	2
				desert needlegrass	1
				annual forbs	1
				Acton's brittlebush	
				Indian ricegrass	
				Mojave woodyaster	
				Mojave yucca	
				Nevada jointfir	
				shrubby deerfretch	
3291: Smithcanyon - 40%-----	Sandy Xeric-Intergrade Slopes (R030XE196CA)	Favorable	950	singleleaf pinyon	52
		Normal	618	blackbrush	17
		Unfavorable	230	Muller oak	12
				other annual forbs	5
				red brome	5
				Mojave yucca	2
				Parry's beargrass	2
				bigberry manzanita	1
				California juniper	1
				desert needlegrass	1
				narrowleaf goldenbush	1
				threadleaf snakeweed	1
				bristly fiddleneck	
				desert globemallow	
				Eastern Mojave buckwheat	



# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3291: Stubbespring - 25%-----	Sandy Xeric-Intergrade Slopes (R030XE196CA)	Favorable	950	blackbrush	55
		Normal	370	Muller oak	22
		Unfavorable	230	Eastern Mojave buckwheat	11
				desert needlegrass	4
				narrowleaf goldenbush	4
				shrubby deervetch	4
				California juniper	
				Mojave yucca	
				Parry's beargrass	
				red brome	
				singleleaf pinyon	
3292: Smithcanyon - 35%-----	Sandy Xeric-Intergrade Slopes (R030XE196CA)	Favorable	950	singleleaf pinyon	52
		Normal	618	blackbrush	17
		Unfavorable	230	Muller oak	12
				other annual forbs	5
				red brome	5
				Mojave yucca	2
				Parry's beargrass	2
				bigberry manzanita	1
				California juniper	1
				desert needlegrass	1
				narrowleaf goldenbush	1
				threadleaf snakeweed	1
				bristly fiddleneck	
				desert globemallow	
				Eastern Mojave buckwheat	
Pinecity - 25%--	Shallow Cool Hills (R030XB189CA)	Favorable	690	red brome	46
		Normal	548	narrowleaf goldenbush	12
		Unfavorable	170	blackbrush	10
				Mexican bladdersage	9
				desert globemallow	8
				California juniper	7
				bristly fiddleneck	2
				redstem stork's bill	2
				Sandberg bluegrass	2
				desert needlegrass	1
				annual forbs	1
				Acton's brittlebush	
				Indian ricegrass	
				Mojave woodyaster	
				Mojave yucca	
				Nevada jointfir	
				shrubby deervetch	
3293: Smithcanyon - 50%-----	Sandy Xeric-Intergrade Slopes (R030XE196CA)	Favorable	950	singleleaf pinyon	43
		Normal	618	bigberry manzanita	28
		Unfavorable	230	Muller oak	22
				red brome	3
				beavertail pricklypear	1
				California juniper	1
				desert needlegrass	1
				Joshua tree	1
				Eastern Mojave buckwheat	
				narrowleaf goldenbush	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3293: Pinecity - 25%--	Shallow Cool Hills (R030XB189CA)	Favorable	690	red brome	46
		Normal	548	narrowleaf goldenbush	12
		Unfavorable	170	blackbrush	10
				Mexican bladdersage	9
				desert globemallow	8
				California juniper	7
				bristly fiddleneck	2
				redstem stork's bill	2
				Sandberg bluegrass	2
				desert needlegrass	1
				annual forbs	1
				Acton's brittlebush	
				Indian ricegrass	
				Mojave woodyaster	
				Mojave yucca	
				Nevada jointfir	
				shrubby deervetch	
3294: Smithcanyon, dry - 80%-----	Dry Sandy Mountain Slopes (R030XE191CA)	Favorable	660	singleleaf pinyon	36
		Normal	650	Muller oak	20
		Unfavorable	195	narrowleaf goldenbush	19
				cheatgrass	18
				Phacelia	5
				Sandberg bluegrass	2
				beavertail pricklypear	
				cryptantha	
				desert needlegrass	
				Eastern Mojave buckwheat	
				green rabbitbrush	
				Indian ricegrass	
				Joshua tree	
				lupine	
				pincushion flower	
				plains pricklypear	
				red brome	
3295: Desertqueen, dry - 40%-----	Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)	Favorable	728	white ratany	20
		Normal	315	white bursage	19
		Unfavorable	164	jojoba	10
				Nevada jointfir	10
				Parish's goldeneye	10
				creosote bush	5
				water jacket	5
				chia	3
				annual forbs	3
				annual forbs	3
				redstem stork's bill	3
				big galleta	2
				desert globemallow	2
				annual forbs	2
				wishbone-bush	2
				Mexican bladdersage	1
				Eastern Mojave buckwheat	
				Mojave woodyaster	
				red brome	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3295:					
Hexie - 20%-----	Very Shallow To	Favorable	728	brownplume wirelettuce	24
	Moderately Deep Gravelly	Normal	530	red brome	23
	Slopes (R030XB193CA)	Unfavorable	164	big galleta	20
				Mojave yucca	6
				annual forbs	5
				Parish's goldeneye	4
				white bursage	4
				desert globemallow	3
				water jacket	3
				Nevada jointfir	2
				white ratany	2
				jojoba	1
				narrowleaf bedstraw	1
				other shrubs	1
				redstem stork's bill	1
				beavertail pricklypear	
				branched pencil cholla	
				burrobrush	
				creosote bush	
				cryptantha	
				curvenut combseed	
				cushion foxtail cactus	
				Eastern Mojave buckwheat	
				Mediterranean grass	
				New Mexico Plumeseed	
				spineflower	
				turpentinebroom	
				wishbone-bush	
3296:					
Desertqueen -					
45%-----	Shallow Cool Hills	Favorable	690	blackbrush	55
	(R030XB189CA)	Normal	200	Parish's goldeneye	14
		Unfavorable	170	California juniper	12
				Eastern Mojave buckwheat	7
				Nevada jointfir	5
				desert globemallow	2
				big galleta	1
				desert needlegrass	1
				Mojave yucca	1
				redstem stork's bill	1
				water jacket	1
				green rabbitbrush	
				Mexican bladdersage	
				Parry's beargrass	
				red brome	
				threadleaf snakeweed	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3296: Pinecity - 35%--	Shallow Cool Hills (R030XB189CA)	Favorable	690	red brome	47
		Normal	600	blackbrush	38
		Unfavorable	170	California juniper	4
				cheatgrass	4
				Acton's brittlebush	1
				Mojave yucca	1
				Nevada jointfir	1
				other annual forbs	1
				Parry's beargrass	1
				redstem stork's bill	1
				water jacket	1
				cryptantha	
				Engelmann's hedgehog	
				cactus	
				Joshua tree	
3297: Desertqueen, warm - 40%-----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	redstem stork's bill	30
		Normal	350	white bursage	20
		Unfavorable	150	Engelmann's hedgehog	12
				cactus	
				creosote bush	8
				desert globemallow	7
				sowthistle	7
				desertdandelion	
				buckwheat	4
				sweetbush	3
				desertsenna	2
				big galleta	1
				branched pencil cholla	1
				jojoba	1
				lupine	1
				Mojave yucca	1
				Nevada jointfir	1
				white ratany	1
Contactmine, dry - 20%-----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	white bursage	28
		Normal	350	creosote bush	21
		Unfavorable	150	redstem stork's bill	12
				white ratany	9
				Mojave yucca	6
				jojoba	5
				desert globemallow	4
				big galleta	3
				desertsenna	3
				Nevada jointfir	3
				bristly fiddleneck	2
				curvenut combseed	1
				desert Indianwheat	1
				smooth desertdandelion	1
				sweetbush	1
				brittle spineflower	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percentage of chief map	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3297: Seanna, dry - 20%-----	Limy Hill 3-5" P.Z. (R030XB139CA)	Favorable	350	redstem stork's bill	36
		Normal	340	creosote bush	33
		Unfavorable	50	bristly fiddleneck	8
				chia	5
				desert globemallow	5
				white bursage	4
				desert Indianwheat	3
				white ratany	2
				beavertail pricklypear	1
				desert trumpet	1
				Engelmann's hedgehog	1
				cactus	
				sowthistle	1
				desertdandelion	
3325: Ironped, warm - 30%-----	Thermic Steep South Slopes (R030XB164CA)	Favorable	420	brittlebush	51
		Normal	280	creosote bush	10
		Unfavorable	150	brittle spineflower	9
				annual forbs	8
				desert poppy	4
				desert trumpet	4
				lacy phacelia	4
				redstem stork's bill	4
				sand fringe pod	4
				white bursage	2
				desert globemallow	
				jojoba	
				water jacket	
				whisperingbells	
Hexie - 15%----	Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)	Favorable	728	white bursage	18
		Normal	430	red brome	17
		Unfavorable	164	big galleta	12
				Parish's goldeneye	12
				water jacket	6
				bristly fiddleneck	5
				Nevada jointfir	5
				combseed	4
				narrowleaf bedstraw	4
				rayless goldenhead	4
				desert needlegrass	2
				Eastern Mojave buckwheat	2
				jojoba	2
				wishbone-bush	2
				bush muhly	1
				desert globemallow	1
				Engelmann's hedgehog	1
				cactus	
				other annual forbs	1
				spiny hopsage	1
				cryptantha	
				desert calico	
				Mojave woodyaster	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3325: Ironped - 15%---	Warm Gravelly Shallow Hills (R030XB172CA)	Favorable	442	Parish's goldeneye	29
		Normal	246	creosote bush	22
		Unfavorable	105	catclaw acacia	7
				Eastern Mojave buckwheat	6
				Nevada jointfir	6
				redstem stork's bill	6
				desert trumpet	4
				white bursage	4
				wishbone-bush	3
				bristly fiddleneck	2
				littleleaf ratany	2
				big galleta	1
				chia	1
				desert globemallow	1
				desert needlegrass	1
				jojoba	1
				Mojave yucca	1
				red brome	1
				water jacket	1
				white ratany	1
				cryptantha	
3335: Xeric Torriorthents - 40%-----	Sandy Xeric-Intergrade Slopes (R030XE196CA)	Favorable	950	singleleaf pinyon	52
		Normal	620	blackbrush	17
		Unfavorable	230	Muller oak	12
				other annual forbs	5
				red brome	5
				Mojave yucca	2
				Parry's beargrass	2
				bigberry manzanita	1
				California juniper	1
				desert needlegrass	1
				narrowleaf goldenbush	1
				threadleaf snakeweed	1
				bristly fiddleneck	
				desert globemallow	
				Eastern Mojave buckwheat	
Xeric Torriorthents, warm - 25%-----	Dry Sandy Mountain Slopes (R030XE191CA)	Favorable	660	singleleaf pinyon	36
		Normal	650	Muller oak	20
		Unfavorable	195	narrowleaf goldenbush	19
				cheatgrass	18
				Phacelia	5
				Sandberg bluegrass	2
				beavertail pricklypear	
				cryptantha	
				desert needlegrass	
				Eastern Mojave buckwheat	
				green rabbitbrush	
				Indian ricegrass	
				Joshua tree	
				lupine	
				pincushion flower	
				plains pricklypear	
				red brome	



# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3336: Xeric Torriorthents - 45%-----	Sandy Xeric-Intergrade Slopes (R030XE196CA)	Favorable Normal Unfavorable	950 950 230	cheatgrass Muller oak California juniper singleleaf pinyon desert bitterbrush Eastern Mojave buckwheat chia desert needlegrass granite prickly phlox spineflower wishbone-bush	56 18 14 8 2 2
Bigbernie - 25%-	Moderately Deep Gravelly Mountain Slopes (R030XB213CA)	Favorable Normal Unfavorable	395 345 112	California juniper bastardsage green rabbitbrush wishbone-bush blackbrush Eastern Mojave buckwheat annual grasses annual forbs Mojave yucca Parish's goldeneye big galleta Mojave sage desert needlegrass Mojave woodyaster Parry's beargrass red brome	15 14 14 12 9 8 5 5 5 5 3 3 1 1
3340: Seanna - 35%----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable Normal Unfavorable	450 350 150	white bursage creosote bush redstem stork's bill white ratany Mojave yucca jojoba desert globemallow big galleta desertsenna Nevada jointfir bristly fiddleneck curvenut combseed desert Indianwheat smooth desertdandelion sweetbush brittle spineflower	28 21 12 9 6 5 4 3 3 3 2 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities--Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3340: Grubstake, moist - 20%----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	white ratany	32
		Normal	225	white bursage	16
		Unfavorable	150	creosote bush	15
				redstem stork's bill	11
				big galleta	8
				Nevada jointfir	6
				bristly fiddleneck	5
				brownplume wirelettuce	4
				Parish's goldeneye	1
				sowthistle	1
				desertdandelion	
				sweetbush	1
Pinecity - 15%--	Shallow Cool Hills (R030XB189CA)	Favorable	690	red brome	46
		Normal	548	narrowleaf goldenbush	12
		Unfavorable	170	blackbrush	10
				Mexican bladdersage	9
				desert globemallow	8
				California juniper	7
				bristly fiddleneck	2
				redstem stork's bill	2
				Sandberg bluegrass	2
				desert needlegrass	1
				annual forbs	1
				Acton's brittlebush	
				Indian ricegrass	
				Mojave woodyaster	
3345: Bigcanyon - 55%	Warm Gravelly Shallow Hills (R030XB172CA)	Favorable	442	catclaw acacia	24
		Normal	280	sowthistle	22
		Unfavorable	105	desertdandelion	
				creosote bush	12
				Nevada jointfir	10
				Parish's goldeneye	8
				Parry's jujube	8
				burrobrush	7
				chia	4
				Eastern Mojave buckwheat	3
				Mojave yucca	1
				queen's-root	1
				buckwheat	
				common Mediterranean grass	
				cryptantha	
				dalea	
				annual forbs	
				pygmy poppy	
				redstem stork's bill	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
3345: Bigcanyon, cool - 20%-----	Moderately Deep Gravelly Mountain Slopes (R030XB213CA)	Favorable	395	California juniper	45
		Normal	345	Sandberg bluegrass	29
		Unfavorable	112	sowthistle	16
				desertdandelion	
				annual forbs	3
				beavertail pricklypear	2
				burrobrush	2
				Eastern Mojave buckwheat	2
				monkeyflower	1
				bristly fiddleneck	
				buckwheat	
				chia	
				cryptantha	
				desert globemallow	
				Nevada jointfir	
				Parry's jujube	
				Virgin River brittlebush	
3440: Pacific Mesa, steep - 65%-----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	creosote bush	62
		Normal	350	white bursage	14
		Unfavorable	150	desert globemallow	6
				redstem stork's bill	4
				bristly fiddleneck	3
				smooth desertdandelion	3
				white ratany	3
				Engelmann's hedgehog	1
				cactus	
				jojoba	1
				Nevada jointfir	1
				Parish's goldeneye	1
				water jacket	1
				cottontop cactus	
				Eschscholzia poppy	
				annual forbs	
				red brome	
Pacific Mesa - 30%-----	Limy 5-7" p.z. (Low Production) (R030XB156CA)	Favorable	350	creosote bush	36
		Normal	290	redstem stork's bill	28
		Unfavorable	100	white bursage	11
				red brome	10
				Engelmann's hedgehog	4
				cactus	
				water jacket	3
				birdcage evening primrose	2
				desert globemallow	2
				desert Indianwheat	2
				Mojave yucca	1
				Nevada jointfir	1
				beavertail pricklypear	
				buckwheat	
				jojoba	
				sowthistle	
				desertdandelion	
				white ratany	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3509: Cajon, very rarely flooded - 60%--	Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)	Favorable	920	chia	31
		Normal	275	white bursage	21
		Unfavorable	124	creosote bush	10
				Hall's shrubby-spurge	9
				Mojave yucca	5
				bristly fiddleneck	4
				brittle spineflower	4
				annual forbs	4
				jojoba	4
				redstem stork's bill	4
				white ratany	2
				branched pencil cholla	1
				Wiggin's cholla	1
				buckwheat	
				daisy desertstar	
				pincushion flower	
				sixweeks threeawn	
				water jacket	
Friedliver - 20%	Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)	Favorable	920	creosote bush	48
		Normal	380	bristly fiddleneck	34
		Unfavorable	124	red brome	4
				redstem stork's bill	4
				white bursage	4
				brownplume wirelettuce	2
				Hall's shrubby-spurge	2
				big galleta	1
				white ratany	1
				chia	
				lupine	
				Mojave yucca	
3525: Cajon - 70%-----	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	creosote bush	59
		Normal	400	bristly fiddleneck	11
		Unfavorable	200	Asian Mustard	9
				smooth desertydandelion	6
				cryptantha	4
				whitemargin sandmat	4
				white bursage	3
				chia	2
				sowthistle	1
				desertydandelion	
				Wiggin's cholla	1
				brownplume wirelettuce	
				buckwheat	
				Mediterranean grass	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3525: Friedliver - 15%	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	curvenut combseed	33
		Normal	460	creosote bush	30
		Unfavorable	200	white bursage	9
				branched pencil cholla	7
				sowthistle	7
				desertdandelion	
				bristly fiddleneck	4
				white ratany	4
				spineflower	3
				birdcage evening primrose	2
				desertsenna	1
				chia	
				annual forbs	
				Mediterranean grass	
				Mojave yucca	
				New Mexico Plumeseed	
				redroot cryptantha	
				redstem stork's bill	
				smooth desertdandelion	
				suncup	
				wolly easterbonnets	
3526: Cajon - 40%----	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	creosote bush	47
		Normal	380	bristly fiddleneck	15
		Unfavorable	200	wollystar	10
				smooth desertdandelion	9
				Mojave yucca	5
				red brome	5
				redstem stork's bill	5
				white bursage	2
				big galleta	1
				desert globemallow	1
				chia	
				Mediterranean grass	
Hypoint - 35%---	Gravelly Outwash (R030XY159CA)	Favorable	500	creosote bush	54
		Normal	275	bristly fiddleneck	13
		Unfavorable	250	desertsenna	11
				white bursage	8
				chia	4
				redstem stork's bill	3
				smooth desertdandelion	3
				white ratany	3
				Mexican bladdersage	1
				annual forbs	
				manybristle cinchweed	
				Mediterranean grass	
				wollystar	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
3526: Arizo, occasionally flooded - 15%--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	Favorable Normal Unfavorable	881 175 60	burrobrush creosote bush smooth desertdandelion catclaw acacia other annual forbs cryptantha Schott's dalea hairy milkweed bristly fiddleneck Wiggin's cholla bladderpod spiderflower buckwheat chia curvenut combseed distant phacelia pincushion flower redstem stork's bill small wirelettuce sweetbush	28 22 22 13 5 3 3 2 1 1
3611: Burntshack, sand surface - 50%--	Sandy Fan Aprons (R030XB174CA)	Favorable Normal Unfavorable	480 275 131	big galleta creosote bush white bursage burrobrush Mojave yucca white ratany Nevada jointfir red brome Joshua tree smooth desertdandelion bristly fiddleneck Mexican bladdersage redstem stork's bill Great Basin langloisia pincushion flower Wiggin's cholla	23 18 12 9 9 8 5 5 3 3 2 2 1
Burntshack - 35%	Sandy Fan Aprons (R030XB174CA)	Favorable Normal Unfavorable	480 275 131	big galleta creosote bush white bursage burrobrush Mojave yucca white ratany Nevada jointfir red brome Joshua tree smooth desertdandelion bristly fiddleneck Mexican bladdersage redstem stork's bill Great Basin langloisia pincushion flower Wiggin's cholla	23 18 12 9 9 8 5 5 3 3 2 2 1



# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3612:					
Burntshack - 75%	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	white bursage	46
		Normal	300	creosote bush	35
		Unfavorable	200	desert trumpet	5
				big galleta	4
				Mojave yucca	4
				Nevada jointfir	3
				desert globemallow	1
				red brome	1
				redstem stork's bill	1
Burntshack, occasionally flooded - 20%--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	Favorable	881	burrobrush	28
		Normal	175	creosote bush	22
		Unfavorable	60	smooth desertdandelion	22
				catclaw acacia	13
				other annual forbs	5
				cryptantha	3
				Schott's dalea	3
				hairy milkweed	2
				bristly fiddleneck	1
				Wiggin's cholla	1
				bladderpod spiderflower	
				buckwheat	
				chia	
				curvenut combseed	
				distant phacelia	
				pincushion flower	
				redstem stork's bill	
				small wirelettuce	
				sweetbush	
3676:					
Morongo, loamy sand, very rarely flooded - 80%--	Sandy Fan Aprons (R030XB174CA)	Favorable	480	big galleta	23
		Normal	275	creosote bush	18
		Unfavorable	131	white bursage	12
				burrobrush	9
				Mojave yucca	9
				white ratany	8
				Nevada jointfir	5
				red brome	5
				Joshua tree	3
				smooth desertdandelion	3
				bristly fiddleneck	2
				Mexican bladdersage	2
				redstem stork's bill	1
				Great Basin langloisia	
				pincushion flower	
				Wiggin's cholla	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3677: Morongo - 80%---	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	bristly fiddleneck	48
		Normal	300	creosote bush	23
		Unfavorable	200	Joshua tree	10
				white bursage	6
				big galleta	3
				white ratany	3
				brittle spineflower	1
				curvenut combseed	1
				Mediterranean grass	1
				Mojave yucca	1
				pincushion flower	1
				redstem stork's bill	1
				wishbone-bush	1
				desert calico	
				annual forbs	
				red brome	
				Wiggin's cholla	
3679: Morongo, cool - 55%-----	Cool Deep Sandy Fans (R030XB168CA)	Favorable	920	cheatgrass	45
		Normal	690	blackbrush	39
		Unfavorable	380	California juniper	11
				Joshua tree	2
				big galleta	1
				Nevada jointfir	1
				Wiggin's cholla	1
				golden linanthus	
Jumborox - 20%--	Cool Deep Sandy Fans (R030XB168CA)	Favorable	920	Muller oak	32
		Normal	500	blackbrush	22
		Unfavorable	380	Eastern Mojave buckwheat	14
				red brome	13
				pincushion flower	6
				desert needlegrass	5
				bristly fiddleneck	2
				California juniper	2
				desert bitterbrush	1
				Nevada jointfir	1
				threadleaf snakeweed	1
				Wiggin's cholla	1
				narrowleaf goldenbush	
3680: Morongo - 85%---	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	creosote bush	45
		Normal	300	white bursage	21
		Unfavorable	200	Nevada jointfir	10
				desertsenna	6
				Mexican bladdersage	6
				Mojave yucca	6
				branched pencil cholla	4
				white ratany	2

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3681: Morongo, very rarely flooded - 45%--	Sandy Fan Aprons (R030XB174CA)	Favorable Normal Unfavorable	480 275 131	big galleta creosote bush white bursage burrobrush Mojave yucca white ratany Nevada jointfir red brome Joshua tree smooth desertdandelion bristly fiddleneck Mexican bladdersage redstem stork's bill Great Basin langloisia pincushion flower Wiggin's cholla	23 18 12 9 9 8 5 5 3 3 2 2 1
Jumborox, dry - 35%-----	Coarse Loamy Very Deep Fan Remnants (R030XB173CA)	Favorable Normal Unfavorable	900 500 250	big galleta creosote bush red brome bristly fiddleneck burrobrush California jointfir Cooper's goldenbush Mexican bladdersage Phacelia Eastern Mojave buckwheat annual forbs Mojave yucca turpentinebroom Wiggin's cholla California juniper desert needlegrass Joshua tree redstem stork's bill white ratany wishbone-bush	47 15 12 5 5 3 3 3 2 1 1 1 1 1 1 1 1 1
3682: Morogno, cool - 50%-----	Cool Deep Sandy Fans (R030XB168CA)	Favorable Normal Unfavorable	920 690 380	cheatgrass blackbrush California juniper Joshua tree big galleta Nevada jointfir Wiggin's cholla golden linanthus	45 39 11 2 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3682: Jumborox - 15%--	Cool Deep Sandy Fans (R030XB168CA)	Favorable	920	Muller oak	32
		Normal	500	blackbrush	22
		Unfavorable	380	Eastern Mojave buckwheat	14
				red brome	13
				pincushion flower	6
				desert needlegrass	5
				bristly fiddleneck	2
				California juniper	2
				desert bitterbrush	1
				Nevada jointfir	1
				threadleaf snakeweed	1
				Wiggin's cholla	1
				narrowleaf goldenbush	
3683: Morongo - 55%---	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	creosote bush	41
		Normal	250	pincushion flower	25
		Unfavorable	200	redstem stork's bill	8
				white bursage	6
				Mojave yucca	5
				curvenut combseed	4
				smooth desertdandelion	4
				branched pencil cholla	3
				white ratany	3
				desertsenna	1
				Mediterranean grass	
Bluecut, very rarely flooded - 30%--	Very Rarely Flooded, Warm Thermic Fan Piedmonts (R030XB192CA)	Favorable	488	branched pencil cholla	14
		Normal	280	white bursage	13
		Unfavorable	115	Mojave yucca	12
				pincushion flower	9
				redstem stork's bill	9
				big galleta	8
				creosote bush	6
				buckwheat	5
				curvenut combseed	5
				desert Indianwheat	5
				Mojave desertstar	5
				desertsenna	4
				littleleaf ratany	3
				brownplume wirelettuce	1
				Wiggin's cholla	1
				desert trumpet	
				jojoba	
				Parry's false	
				pararie-flower	
				spiny menodora	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3684: Morogno, warm - 85%-----	Very Rarely Flooded, Warm Thermic Fan Piedmonts (R030XB192CA)	Favorable Normal Unfavorable	488 280 115	creosote bush big galleta desertsenna jojoba Mojave indigobush Nevada jointfir bristly fiddleneck burrobrush Mojave yucca Eastern Mojave buckwheat Mexican bladdersage redstem stork's bill	50 18 9 6 6 3 2 2 2 1 1
3685: Morogno, cool - 65%-----	Cool Deep Sandy Fans (R030XB168CA)	Favorable Normal Unfavorable	920 560 380	cheatgrass blackbrush desert bitterbrush Eastern Mojave buckwheat red brome Mexican bladdersage California juniper Joshua tree narrowleaf goldenbush Nevada jointfir water jacket wishbone-bush big galleta desert needlegrass gilgia Sandberg bluegrass	39 32 9 5 4 3 2 2 1 1 1 1 1 1 1
Desertqueen, undulating - 15%-----	Dissected Pediment, Cool (R030XB166CA)	Favorable Normal Unfavorable	440 400 92	blackbrush red brome rubber rabbitbrush Joshua tree larkspur California juniper Mojave yucca Sandberg bluegrass curvenut combseed narrowleaf goldenbush trefoil wishbone-bush	45 32 11 3 3 2 2 2 1 1 1 1
3690: Nasagold - 85%--	Coarse Loamy Very Deep Fan Remnants (R030XB173CA)	Favorable Normal Unfavorable	900 610 250	water jacket bristly fiddleneck big galleta redstem stork's bill creosote bush peach thorn Joshua tree Nevada jointfir red brome Wiggin's cholla goldenbush	35 15 13 11 10 10 2 2 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
3695:					
Gocougs - 80%---	Moderately Deep To Very	Favorable	920	bristly fiddleneck	25
	Deep Loamy Fan Remnants	Normal	722	red brome	24
	(R030XB218CA)	Unfavorable	124	white bursage	18
				chia	14
				redstem stork's bill	13
				big galleta	2
				branched pencil cholla	1
				Hall's shrubby-spurge	1
				jojoba	1
				Mojave yucca	1
				creosote bush	
				cryptantha	
				grape soda lupine	
				pincushion flower	
4031:					
Crosgrain - 50%	Limy 5-7" p.z. (Low	Favorable	350	white bursage	50
	Production) (R030XB156CA)	Normal	250	creosote bush	20
		Unfavorable	100	other shrubs	10
				desert needlegrass	5
				littleleaf ratany	5
				other perennial forbs	5
Crackerjack -					
30%-----	Limy Hill 3-5" P.Z.	Favorable	350	creosote bush	54
	(R030XB139CA)	Normal	250	curvenut combseed	30
		Unfavorable	50	redstem stork's bill	3
				white bursage	3
				cryptantha	2
				littleleaf ratany	2
				branched pencil cholla	1
				bristly fiddleneck	1
				jojoba	1
				Mojave yucca	1
				smooth desertdandelion	1
				white ratany	1
				desert globemallow	
				Mediterranean grass	
				red brome	
				wollystar	
Pinkcan, dry -					
15%-----	Limy 5-7" p.z. (Low	Favorable	350	curvenut combseed	38
	Production) (R030XB156CA)	Normal	250	creosote bush	35
		Unfavorable	100	annual forbs	5
				white bursage	5
				Mojave yucca	3
				redstem stork's bill	3
				littleleaf ratany	2
				red brome	2
				bristly fiddleneck	1
				desert globemallow	1
				desert trumpet	1
				Nevada jointfir	1
				pincushion flower	1
				white ratany	1
				whitemargin sandmat	1
				common Mediterranean	
				grass	



# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4041: Silvermine - 40%	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	creosote bush	30
		Normal	350	white bursage	22
		Unfavorable	150	white ratany	13
				Mojave yucca	8
				desert pepperweed	6
				desertsenna	5
				Nevada jointfir	5
				desert Indianwheat	2
				Mexican bladdersage	2
				sweetbush	2
				bristly fiddleneck	1
				catclaw acacia	1
				desert globemallow	1
				Mojave indigobush	1
				sowthistle	1
				desertdandelion	
Helendale - 30%	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	white bursage	46
		Normal	300	creosote bush	35
		Unfavorable	200	desert trumpet	5
				big galleta	4
				Mojave yucca	4
				Nevada jointfir	3
				desert globemallow	1
				red brome	1
				redstem stork's bill	1
Burntshack, very rarely flooded - 20%--	Sandy Plain 3-5" P.Z. (R030XB148CA)	Favorable	1400	big galleta	64
		Normal	1000	creosote bush	15
		Unfavorable	700	Indian ricegrass	10
				other shrubs	7
				other perennial grasses	3
				other annual forbs	1
4064: Gravesumit - 55%	Granitic Loam (R030XB137CA)	Favorable	500	creosote bush	31
		Normal	340	big galleta	16
		Unfavorable	275	bristly fiddleneck	14
				white ratany	11
				redstem stork's bill	10
				lupine	5
				Hall's shrubby-spurge	3
				littleleaf ratany	3
				wollystar	3
				other annual forbs	2
				buckwheat	1
				Mexican bladdersage	1
				catclaw acacia	
				red brome	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4064: Helendale, sandy surface - 35%--	Granitic Loam (R030XB137CA)	Favorable Normal Unfavorable	500 340 275	creosote bush big galleta bristly fiddleneck white ratany redstem stork's bill lupine Hall's shrubby-spurge littleleaf ratany wollystar other annual forbs buckwheat Mexican bladdersage catclaw acacia red brome	31 16 14 11 10 5 3 3 3 2 1 1
4071: Helendale - 65%	LIMY 5-7 P.Z. (R030XB005NV)	Favorable Normal Unfavorable	500 300 200	white bursage creosote bush desert trumpet big galleta Mojave yucca Nevada jointfir desert globemallow red brome redstem stork's bill	46 35 5 4 4 3 1 1 1
Desertqueen, very rarely flooded - 15%--	Cool Shallow Fans Over Pediment (R030XB188CA)	Favorable Normal Unfavorable	750 411 335	creosote bush bristly fiddleneck Mojave yucca blackbrush burrobrush Great Basin langloisia redstem stork's bill littleleaf ratany desertsenna pincushion flower white ratany Eastern Mojave buckwheat cryptantha turpentinebroom water jacket	16 14 14 10 9 7 7 6 5 4 3 2 1 1 1
4091: Littlefargo - 85%-----	Cool Deep Sandy Fans (R030XB168CA)	Favorable Normal Unfavorable	920 500 380	Muller oak blackbrush Eastern Mojave buckwheat red brome pincushion flower desert needlegrass bristly fiddleneck California juniper desert bitterbrush Nevada jointfir threadleaf snakeweed Wiggin's cholla narrowleaf goldenbush	32 22 14 13 6 5 2 2 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4245: Bluecut - 40%---	Loamy Very Deep Fan Remnants (R030XB183CA)	Favorable Normal Unfavorable	492 380 140	blackbrush creosote bush pincushion flower white bursage big galleta Mojave yucca redstem stork's bill Eastern Mojave buckwheat white ratany bristly fiddleneck red brome burrobrush smooth desertdandelion jojoba Joshua tree Nevada jointfir	25 13 12 10 7 7 7 4 4 3 3 2 2 1
Morongo, very rarely flooded - 25%--	Sandy Fan Aprons (R030XB174CA)	Favorable Normal Unfavorable	480 275 131	big galleta creosote bush white bursage burrobrush Mojave yucca white ratany Nevada jointfir red brome Joshua tree smooth desertdandelion bristly fiddleneck Mexican bladdersage redstem stork's bill Great Basin langloisia pincushion flower Wiggin's cholla	23 18 12 9 9 8 5 5 3 3 2 2 1
Yander, very rarely flooded - 15%--	Sandy Fan Aprons (R030XB174CA)	Favorable Normal Unfavorable	480 275 131	big galleta creosote bush white bursage burrobrush Mojave yucca white ratany Nevada jointfir red brome Joshua tree smooth desertdandelion bristly fiddleneck Mexican bladdersage redstem stork's bill Great Basin langloisia pincushion flower Wiggin's cholla	23 18 12 9 9 8 5 5 3 3 2 2 1

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4260:					
Minhoht - 45%---	Very Shallow Duripan Fan Remnants (R030XB220CA)	Favorable	358	Asian Mustard	27
		Normal	250	creosote bush	20
		Unfavorable	132	white bursage	17
				Nevada jointfir	11
				Hall's shrubby-spurge	8
				curvenut combseed	6
				blackbrush	4
				red brome	3
				Mojave yucca	2
				desert globemallow	1
				desert princesplume	1
				cryptantha	
				desert polygala	
				jojoba	
				lacy phacelia	
				lotebush	
				pincushion flower	
				sowthistle	
				desertdandelion	
				water jacket	
				white ratany	
Corbilt, rarely flooded - 40%--	Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)	Favorable	920	creosote bush	60
		Normal	327	white bursage	9
		Unfavorable	124	Mojave yucca	7
				jojoba	6
				redstem stork's bill	6
				chia	3
				Hall's shrubby-spurge	3
				branched pencil cholla	2
				white ratany	2
				water jacket	1
				Wiggin's cholla	1
				buckwheat	
				desertsenna	
				pincushion flower	
				wishbone-bush	
4265:					
Werewolf, warm - 80%-----	LIMY 3-5 P.Z. (R030XB019NV)	Favorable	200	creosote bush	88
		Normal	175	white bursage	10
		Unfavorable	75	branched pencil cholla	1
				curvenut combseed	1
				white ratany	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4270: Yuccabutte, extremely cobble sandy loam - 95%-----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable Normal Unfavorable	450 300 150	white bursage Mojave yucca white ratany creosote bush jojoba desertsenna Nevada jointfir other annual forbs Cooper's goldenbush red brome smooth desertdandelion	77 6 5 4 4 2 1 1    
4271: Yuccabutte, warm - 60%-----	Limy 5-7" p.z. (Low Production) (R030XB156CA)	Favorable Normal Unfavorable	350 160 100	white bursage creosote bush white ratany Mojave yucca desertsenna branched pencil cholla Wiggin's cholla cryptantha redstem stork's bill smooth desertdandelion	51 22 9 8 3 2 2 1 1 1
Arizo, rarely flooded - 30%---	Gravelly Outwash (R030XY159CA)	Favorable Normal Unfavorable	500 250 250	creosote bush desertsenna Mojave yucca jojoba chia dalea annual forbs smooth desertdandelion white ratany burrobrush cotton-top cactus cryptantha Phacelia	79 8 5 3 1 1 1 1 1    
4275: Pinkcan - 35%---	LIMY 5-7 P.Z. (R030XB005NV)	Favorable Normal Unfavorable	500 330 200	white bursage creosote bush peach thorn white ratany lotebush desertsenna lupine redstem stork's bill big galleta chia Eastern Mojave buckwheat	39 28 15 9 5 2 1 1    

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4275: Werewolf - 25%--	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	creosote bush	34
		Normal	360	bristly fiddleneck	27
		Unfavorable	200	desertsenna	16
				pincushion flower	14
				white bursage	3
				Mediterranean grass	2
				redstem stork's bill	2
				Mojave yucca	1
				white ratany	1
				annual grasses	
				brittle spineflower	
Gocougs, warm - 15%-----	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	creosote bush	51
		Normal	250	white bursage	39
		Unfavorable	200	white ratany	5
				desert globemallow	2
				Mojave yucca	2
				redstem stork's bill	1
				bristly fiddleneck	
				annual forbs	
				sowthistle	
				desertdandelion	
4280: Mekkadale - 55%	Limy Hill 3-5" P.Z. (R030XB139CA)	Favorable	350	creosote bush	51
		Normal	250	redstem stork's bill	23
		Unfavorable	50	bristly fiddleneck	9
				annual forbs	5
				white bursage	3
				desert globemallow	2
				chia	1
				jojoba	1
				Mojave yucca	1
				Nevada jointfir	1
				red brome	1
				white ratany	1
				wishbone-bush	1
Edalph, warm - 25%-----	Limy Hill 3-5" P.Z. (R030XB139CA)	Favorable	350	creosote bush	51
		Normal	225	redstem stork's bill	23
		Unfavorable	50	bristly fiddleneck	9
				annual forbs	5
				white bursage	3
				desert globemallow	2
				chia	1
				jojoba	1
				Mojave yucca	1
				Nevada jointfir	1
				red brome	1
				white ratany	1
				wishbone-bush	1



# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4285:					
Typic					
Argidurids -					
35%-----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	white bursage	28
		Normal	350	creosote bush	21
		Unfavorable	150	redstem stork's bill	12
				white ratany	9
				Mojave yucca	6
				jojoba	5
				desert globemallow	4
				big galleta	3
				desertsenna	3
				Nevada jointfir	3
				bristly fiddleneck	2
				curvenut combseed	1
				desert Indianwheat	1
				smooth desertdandelion	1
				sweetbush	1
				brittle spineflower	
Coppermine - 30%	Limy Hill 3-5" P.Z. (R030XB139CA)	Favorable	350	spineflower	29
		Normal	300	desert Indianwheat	19
		Unfavorable	50	creosote bush	17
				Engelmann's hedgehog	7
				cactus	
				Mediterranean grass	6
				suncup	5
				redstem stork's bill	4
				white bursage	3
				desertsenna	2
				jojoba	2
				smooth desertdandelion	2
				California fagonbush	1
				Mojave yucca	1
				sweetbush	1
				white ratany	1
				buckwheat	
				desert trumpet	
				annual forbs	
				Parry's false	
				pararie-flower	
				pygmy poppy	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4285: Minhoys, warm - 25%-----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	creosote bush	29
		Normal	350	white ratany	16
		Unfavorable	150	white bursage	12
				desert Indianwheat	9
				curvenut combseed	7
				redstem stork's bill	7
				smooth desertdandelion	7
				jojoba	4
				cushion foxtail cactus	3
				Mojave yucca	2
				desertsenna	1
				low woollygrass	1
				Mediterranean grass	1
				woody crinklemat	1
				desert globemallow	
				desert trumpet	
				annual forbs	
				Parry's false	
				pararie-flower	
4403: Arizo, rarely flooded, channeled - 50%	Flooded Gravelly Fans (R030XY038CA)	Favorable	765	curvenut combseed	61
		Normal	700	creosote bush	18
		Unfavorable	60	smooth desertdandelion	7
				desertsenna	3
				Mojave yucca	3
				desert globemallow	2
				Mediterranean grass	2
				white ratany	2
				Parish's goldeneye	1
				Schott's dalea	1
				bristly fiddleneck	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
4403: Arizo, rarely flooded - 25%--	Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)	Favorable	300	sweetbush	18
		Normal	150	burrobrush	17
		Unfavorable	125	creosote bush	13
				pincushion	10
				catclaw acacia	6
				distant phacelia	5
				peach thorn	5
				smooth desertdandelion	5
				bristly fiddleneck	4
				Schott's dalea	3
				curvenut combseed	2
				Thurber's sandpaper plant	2
				brownplume wirelettuce	1
				chia	1
				jojoba	1
				Mediterranean grass	1
				Mexican bladdersage	1
				Mojave indigobush	1
				other annual forbs	1
				pincushion flower	1
				red brome	1
				redstem stork's bill	1
				Mojave yucca	
				Parish's goldeneye	
				white ratany	
Arizo - 20%----	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	curvenut combseed	57
		Normal	300	creosote bush	17
		Unfavorable	200	lupine	5
				branched pencil cholla	3
				littleleaf ratany	3
				peach thorn	3
				white bursage	3
				bristly fiddleneck	2
				desert globemallow	2
				Mojave yucca	2
				Mediterranean grass	1
				redstem stork's bill	1
				Wiggin's cholla	1
				red brome	
				smooth desertdandelion	
				sweetbush	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4440: Dragonwash, occasionally flooded - 55%--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	Favorable Normal Unfavorable	881 250 60	curvenut combseed creosote bush western tansymustard redstem stork's bill pincushion flower common Mediterranean grass white ratany Mojave yucca buckwheat catclaw acacia combseed Nevada jointfir Schott's dalea woolly easterbonnets	35 25 17 11 5 3  3 1     
Dragonwash, frequently flooded - 35%--	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	Favorable Normal Unfavorable	881 150 60	desert willow bladderpod spiderflower smoketree American Threefold brownplume wirelettuce catclaw acacia burrobrush bristly fiddleneck chia desert almond Mojave indigobush Mojave rabbitbrush red brome	35 26 25 7 3 3 1       
4450: Morongo, occasionally flooded - 75%--	Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)	Favorable Normal Unfavorable	700 690 280	peach thorn catclaw acacia bristly fiddleneck burrobrush red brome cheatgrass common Mediterranean grass annual forbs Joshua tree Nevada jointfir Schott's dalea buckwheat California jointfir desert trumpet redstem stork's bill	31 29 26 5 3 1 1  1 1 1 1   

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			<u>Lb/ac</u>		<u>Pct</u>
4450: Morongo, frequently flooded - 15%--	Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)	Favorable	1793	desert willow	88
		Normal	1400	bristly fiddleneck	3
		Unfavorable	1100	redstem stork's bill	2
				brittlebush	1
				burrobrush	1
				catclaw acacia	1
				common Mediterranean grass	1
				desertsenna	1
				Mojave indigobush	1
				red brome	1
				blazingstar	
				cheatgrass	
				combseed	
				cryptantha	
				evening-primrose	
				annual forbs	
				sowthistle	
				desertdandelion	
				Wiggin's cholla	
				wolly easterbonnets	
4605: Pinecity, moist - 80%----	Cool Shallow Fans Over Pediment (R030XB188CA)	Favorable	750	creosote bush	25
		Normal	460	blackbrush	13
		Unfavorable	335	Eastern Mojave buckwheat	10
				Mojave yucca	9
				white ratany	8
				Acton's brittlebush	7
				Mexican bladdersage	7
				bristly fiddleneck	2
				burrobrush	2
				chia	2
				Great Basin langloisia	2
				littleleaf ratany	2
				Nevada jointfir	2
				pincushion flower	2
				redstem stork's bill	2
				Cooper's goldenbush	1
				desert needlegrass	1
				Joshua tree	1
				Mojave cottonthorn	1
				Wiggin's cholla	1

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4606:					
Pinecity - 60%--	Dissected Pediment, Cool (R030XB166CA)	Favorable	440	Eastern Mojave buckwheat	31
		Normal	400	Mojave yucca	8
		Unfavorable	92	Nevada jointfir	6
				pincushion flower	6
				shrubby deervetch	6
				bristly fiddleneck	5
				desert needlegrass	5
				buckwheat	4
				littleleaf ratany	4
				Mexican bladdersage	4
				red brome	4
				redstem stork's bill	4
				creosote bush	3
				burrobrush	2
				California juniper	2
				big galleta	1
				chia	1
				Cooper's goldenbush	1
				jojoba	1
				Joshua tree	1
				wishbone-bush	1
4607:					
Pinecity - 85%--	Dissected Pediment, Cool (R030XB166CA)	Favorable	440	Eastern Mojave buckwheat	31
		Normal	330	Mojave yucca	8
		Unfavorable	92	Nevada jointfir	6
				pincushion flower	6
				shrubby deervetch	6
				bristly fiddleneck	5
				desert needlegrass	5
				buckwheat	4
				littleleaf ratany	4
				Mexican bladdersage	4
				red brome	4
				redstem stork's bill	4
				creosote bush	3
				burrobrush	2
				California juniper	2
				big galleta	1
				chia	1
				Cooper's goldenbush	1
				jojoba	1
				Joshua tree	1
				wishbone-bush	1
4608:					
Pinecity - 60%--	Dissected Pediment, Cool (R030XB166CA)	Favorable	440	blackbrush	36
		Normal	250	Eastern Mojave buckwheat	31
		Unfavorable	92	goldenbush	16
				Nevada jointfir	5
				littleleaf ratany	3
				Acton's brittlebush	2
				red brome	2
				shrubby deervetch	2
				California juniper	1
				Joshua tree	1
				turpentine bush	1
				chia	
				desert needlegrass	
				pincushion flower	



# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4610: Desertqueen - 35%-----	Cool Shallow Fans Over Pediment (R030XB188CA)	Favorable Normal Unfavorable	750 411 335	creosote bush bristly fiddleneck Mojave yucca blackbrush burrobrush Great Basin langloisia redstem stork's bill littleleaf ratany desertsenna pincushion flower white ratany Eastern Mojave buckwheat cryptantha turpentinebroom water jacket	16 14 14 10 9 7 7 6 5 4 3 2 1 1 1
Jumborox, warm - 25%-----	Loamy Very Deep Fan Remnants (R030XB183CA)	Favorable Normal Unfavorable	492 375 140	Mojave yucca blackbrush desertsenna redstem stork's bill creosote bush bristly fiddleneck chuckwalla combseed pincushion flower common Mediterranean grass Great Basin langloisia Panamint crptantha Nevada jointfir white ratany burrobrush Eastern Mojave buckwheat annual forbs Mexican bladdersage shrubby deervetch water jacket whisperingbells	24 14 12 11 9 5 5 5 3 3 3 3 2 2 1 1 1 1 1 1 1
4615: Desertqueen, cool - 45%-----	Dissected Pediment, Cool (R030XB166CA)	Favorable Normal Unfavorable	440 400 92	blackbrush red brome rubber rabbitbrush Joshua tree larkspur California juniper Mojave yucca Sandberg bluegrass curvenut combseed narrowleaf goldenbush trefoil wishbone-bush	45 32 11 3 3 2 2 2 2 2 2 2 2

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4615: Jumborox - 25%--	Cool Deep Sandy Fans (R030XB168CA)	Favorable	920	Muller oak	32
		Normal	500	blackbrush	22
		Unfavorable	380	Eastern Mojave buckwheat	14
				red brome	13
				pincushion flower	6
				desert needlegrass	5
				bristly fiddleneck	2
				California juniper	2
				desert bitterbrush	1
				Nevada jointfir	1
				threadleaf snakeweed	1
				Wiggin's cholla	1
				narrowleaf goldenbush	
4620: Stranger - 40%--	Warm Sloping Pediments (R030XB225CA)	Favorable	530	Hall's shrubby-spurge	22
		Normal	430	white bursage	12
		Unfavorable	230	Parish's goldeneye	11
				Bigelow's nolina	7
				Engelmann's hedgehog	6
				cactus	
				Acton's brittlebush	5
				littleleaf ratany	5
				catclaw acacia	4
				annual forbs	4
				jojoba	4
				Nevada jointfir	4
				bastardsage	3
				Mojave yucca	3
				big galleta	2
				Eastern Mojave buckwheat	2
				redstem stork's bill	2
				California juniper	1
				cushion foxtail cactus	1
				narrowleaf bedstraw	1
				Wiggin's cholla	1
				mouse's eye	
Grubstake, moist - 20%----	Limy Hill 5-7" p.z. (R030XB140CA)	Favorable	450	white bursage	35
		Normal	240	Mojave yucca	15
		Unfavorable	150	creosote bush	14
				jojoba	8
				Nevada jointfir	7
				littleleaf ratany	4
				Parish's goldeneye	3
				redstem stork's bill	3
				branched pencil cholla	2
				brittlebush	2
				Wiggin's cholla	2
				desert globemallow	1
				desert needlegrass	1
				Engelmann's hedgehog	1
				cactus	
				narrowleaf bedstraw	1
				wishbone-bush	1
				cryptantha	
				annual forbs	
				whisperingbells	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4625:					
Grinder - 50%---	Loamy Fan Remnants And Pediments (R030XB221CA)	Favorable	402	white bursage	35
		Normal	325	blackbrush	27
		Unfavorable	195	Mojave yucca	20
				Hall's shrubby-spurge	9
				branched pencil cholla	3
				Wiggin's cholla	2
				California juniper	1
				chia	1
				cryptantha	1
				water jacket	1
				Eastern Mojave buckwheat	
				Mojave woodyaster	
Grinder, cool - 20%-----	Warm Sloping Pediments (R030XB225CA)	Favorable	530	Hall's shrubby-spurge	37
		Normal	330	Parish's goldeneye	8
		Unfavorable	230	white bursage	8
				Eastern Mojave buckwheat	6
				Nevada jointfir	5
				narrowleaf bedstraw	4
				desertsenna	3
				Engelmann's hedgehog	3
				cactus	
				jojoba	3
				redstem stork's bill	3
				shrubby deervetch	3
				sweetbush	3
				chia	2
				Mojave woodyaster	2
				Mojave yucca	2
				Parry's beargrass	2
				rayless goldenhead	2
				water jacket	2
				littleleaf ratany	1
				white ratany	1
				brownplume wirelettuce	
Pinkcan, cool - 15%-----	Loamy Fan Remnants And Pediments (R030XB221CA)	Favorable	402	white bursage	35
		Normal	325	blackbrush	27
		Unfavorable	195	Mojave yucca	20
				Hall's shrubby-spurge	9
				branched pencil cholla	3
				Wiggin's cholla	2
				California juniper	1
				chia	1
				cryptantha	1
				water jacket	1
				Eastern Mojave buckwheat	
				Mojave woodyaster	

# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4630: Thunderclap - 50%-----	Xeric Very Deep Sandy Fan Aprons On Pediments (R030XE200CA)	Favorable Normal Unfavorable	570 420 171	smooth desertdandelion annual forbs Great Basin langloisia small wirelettuce Mojave yucca Parry's wirelettuce desert needlegrass blackbrush cheatgrass Indian ricegrass desert globemallow red brome whitemargin sandmat	30 25 18 13 6 3 2 1 1 1 1 1
Smithcanyon - 30%-----	Sandy Xeric-Intergrade Slopes (R030XE196CA)	Favorable Normal Unfavorable	950 618 230	singleleaf pinyon blackbrush Muller oak other annual forbs red brome Mojave yucca Parry's beargrass bigberry manzanita California juniper desert needlegrass narrowleaf goldenbush threadleaf snakeweed bristly fiddleneck desert globemallow Eastern Mojave buckwheat	52 17 12 5 5 2 2 1 1 1 1 1 1 1
4804: Ironped - 25%---	Warm Gravelly Shallow Hills (R030XB172CA)	Favorable Normal Unfavorable	442 246 105	Parish's goldeneye creosote bush bristly fiddleneck Mojave sage desert needlegrass red brome wishbone-bush jojoba big galleta Eastern Mojave buckwheat Nevada jointfir Parry's wirelettuce white ratany	31 28 15 9 4 4 4 2 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4804: Pinecity - 20%--	Shallow Cool Hills (R030XB189CA)	Favorable	690	red brome	46
		Normal	548	narrowleaf goldenbush	12
		Unfavorable	170	blackbrush	10
				Mexican bladdersage	9
				desert globemallow	8
				California juniper	7
				bristly fiddleneck	2
				redstem stork's bill	2
				Sandberg bluegrass	2
				desert needlegrass	1
				annual forbs	1
				Acton's brittlebush	
				Indian ricegrass	
				Mojave woodyaster	
				Mojave yucca	
				Nevada jointfir	
				shrubby deervetch	
4805: Ironped, cool - 30%-----	Dissected Pediment (R030XB171CA)	Favorable	400	blackbrush	22
		Normal	240	Acton's brittlebush	19
		Unfavorable	76	redstem stork's bill	16
				trefoil	12
				Nevada jointfir	8
				catclaw acacia	5
				Eastern Mojave buckwheat	3
				other annual forbs	3
				Parish's goldeneye	3
				white ratany	3
				Mojave yucca	2
				littleleaf ratany	1
				Mediterranean grass	1
				pincushion flower	1
				smooth desertdandelion	1
4811: Pioneertown - 10%-----	Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)	Favorable	930	Muller oak	24
		Normal	680	blackbrush	15
		Unfavorable	315	red brome	14
				desert needlegrass	11
				combseed	6
				Sandberg bluegrass	6
				forb, perennial	5
				forb, perennial	5
				broom snakeweed	3
				Mexican bladdersage	3
				narrowleaf bedstraw	2
				narrowleaf goldenbush	2
				California juniper	1
				Eastern Mojave buckwheat	1
				Parry's beargrass	1
				singleleaf pinyon	1
				annual forbs	
				Mojave sage	
				Mojave yucca	

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4825: Cajon, rarely flooded - 20%--	LIMY 5-7 P.Z. (R030XB005NV)	Favorable	500	creosote bush	75
		Normal	310	Mojave yucca	12
		Unfavorable	200	white ratany	7
				big galleta	2
				white bursage	2
				Nevada jointfir	1
				Wiggin's cholla	1
				bristly fiddleneck	
				buckwheat	
				catclaw acacia	
				gilia	
				smooth desertdandelion	
Grubstake - 20%	Warm Shallow Pediments (R030XB228CA)	Favorable	305	creosote bush	58
		Normal	100	white ratany	19
		Unfavorable	90	sweetbush	16
				white bursage	7
				burrobrush	
				chia	
				popcornflower	
				Schott's dalea	
Stranger, warm - 15%-----	Warm Shallow Pediments (R030XB228CA)	Favorable	305	desertsenna	25
		Normal	180	creosote bush	20
		Unfavorable	90	white bursage	19
				Mojave yucca	14
				white ratany	14
				littleleaf ratany	3
				Acton's brittlebush	1
				catclaw acacia	1
				jojoba	1
				Parish's goldeneye	1
				smooth desertdandelion	1
				buckwheat	
				chia	
				desert trumpet	
				lupine	
				Schott's dalea	



# Soil Survey of Joshua Tree National Park, California

Table 5.-Ecological Sites and Characteristic Plant Communities-Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4830: Pinecity, cool - 10%-----	Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)	Favorable Normal Unfavorable	930 680 315	Muller oak blackbrush red brome desert needlegrass combseed Sandberg bluegrass forb, perennial forb, perennial broom snakeweed Mexican bladdersage narrowleaf bedstraw narrowleaf goldenbush California juniper Eastern Mojave buckwheat Parry's beargrass singleleaf pinyon annual forbs Mojave sage Mojave yucca	24 15 14 11 6 6 5 5 3 3 2 2 1 1 1 1 1
4900: Aguilareal - 15%	Warm Gravelly Shallow Hills (R030XB172CA)	Favorable Normal Unfavorable	442 246 105	Parish's goldeneye creosote bush catclaw acacia Eastern Mojave buckwheat Nevada jointfir redstem stork's bill desert trumpet white bursage wishbone-bush bristly fiddleneck littleleaf ratany big galleta chia desert globemallow desert needlegrass jojoba Mojave yucca red brome water jacket white ratany cryptantha	29 22 7 6 6 6 4 4 3 2 2 1 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 5.—Ecological Sites and Characteristic Plant Communities—Continued

Map unit symbol, name, and local phase and percent of map unit	Ecological site name and number	Total production		Characteristic plants	Composition for rangeland
		Kind of year	Dry weight		
			Lb/ac		Pct
4900:					
Lostpalms - 15%	Warm Gravelly Shallow Hills (R030XB172CA)	Favorable	442	Parish's goldeneye	29
		Normal	246	creosote bush	22
		Unfavorable	105	catclaw acacia	7
				Eastern Mojave buckwheat	6
				Nevada jointfir	6
				redstem stork's bill	6
				desert trumpet	4
				white bursage	4
				wishbone-bush	3
				bristly fiddleneck	2
				littleleaf ratany	2
				big galleta	1
				chia	1
				desert globemallow	1
				desert needlegrass	1
				jojoba	1
				Mojave yucca	1
				red brome	1
				water jacket	1
				white ratany	1
				cryptantha	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover

(This report gives the canopy cover for the plant species associated with the map unit soil components. Only soils and miscellaneous land types with correlated ecological sites are shown. Canopy cover is determined by crown perimeter-vertical projection by species. This cover can overlap in layers by species so total cover can be greater than 100 percent. Plants listed with no percent canopy cover are less than one percent cover)

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1220: Jadestorm - 60%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush creosote bush California fagonbush pincushion flower cryptantha desert Indianwheat low woollygrass Schott's dalea white bursage	15 4 2 2 1 1
Blackeagle, cool - 20%-----	Low-Production Hyperthermic Hills (R030XD004CA)	creosote bush desert Indianwheat pincushion flower curvenut combseed sowthistle desertdandelion cryptantha	2 2 2 1 1
1225: Blackeagle - 65%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush creosote bush California fagonbush pincushion flower cryptantha desert Indianwheat low woollygrass Schott's dalea white bursage	15 4 2 2 1 1
1230: Jadestorm - 45%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush creosote bush annual forbs Mediterranean grass bristly fiddleneck buckwheat Mojave desertstar smooth desertdandelion white bursage	8 2 1 1
Jadestorm, cool - 20%-----	Hyperthermic Dry Hills (R030XD001CA)	creosote bush smooth desertdandelion white bursage cryptantha curvenut combseed desert Indianwheat Mediterranean grass	8 5 4

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
1240:			
Meccapass - 45%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush	8
		pincushion	6
		desert Indianwheat	5
		creosote bush	4
		California fagonbush	2
		Phacelia	1
		pincushion flower	1
Bulletproof - 20%--	Hyperthermic Steep North Slopes (R030XD040CA)	other annual forbs	6
		white bursage	6
		sweetbush	4
		Parish's goldeneye	3
		smooth desertdandelion	3
		bastardsage	2
		brittlebush	2
		curvenut combseed	2
		brownplume wirelettuce	1
		creosote bush	1
		desert trumpet	1
		Eastern Mojave buckwheat	1
		Mojave woodyaster	1
		narrowleaf bedstraw	1
		other shrubs	1
		red brome	1
		white ratany	1
		wishbone-bush	1
1241:			
Meccapass - 45%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush	8
		pincushion	6
		desert Indianwheat	5
		creosote bush	4
		California fagonbush	2
		Phacelia	1
		pincushion flower	1
Seanna - 20%-----	Limy Hill 5-7" p.z. (R030XB140CA)	white bursage	13
		creosote bush	8
		redstem stork's bill	3
		white ratany	3
		desert globemallow	2
		desert Indianwheat	2
		jojoba	2
		Mojave yucca	2
		big galleta	1
		bristly fiddleneck	1
		curvenut combseed	1
		desertsenna	1
		Nevada jointfir	1
		smooth desertdandelion	1
		sweetbush	1
		brittle spineflower	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1241: Contactmine, dry - 20%-----	Limy Hill 5-7" p.z. (R030XB140CA)	white bursage  creosote bush  redstem stork's bill  white ratany  desert globemallow  desert Indianwheat  jojoba  Mojave yucca  big galleta  bristly fiddleneck  curvenut combseed  desertsenna  Nevada jointfir  smooth desertdandelion  sweetbush  brittle spineflower	13 8 3 3 2 2 2 1 1 1 1 1 1
1242: Meccapass - 40%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush  pincushion  desert Indianwheat  creosote bush  California fagonbush  Phacelia  pincushion flower	8 6 5 4 2 1 1
Jadestorm - 25%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush  creosote bush  buckwheat  California fagonbush  cryptantha  four o'clock  Hall's shrubby-spurge  trefoil  white bursage  desert lavender  annual forbs	6 3 1 1 1 1 1 1 1
1250: Ironlung - 50%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush  Schott's dalea  creosote bush  calthaleaf phacelia  Eschscholzia poppy  white bursage  wishbone-bush  chia  annual forbs  pincushion flower  redstem stork's bill  smooth desertdandelion	10 3 2 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1250: Ironlung, cool - 20%-----	Hyperthermic Steep North Slopes (R030XD040CA)	smooth desertdandelion white bursage sweetbush Mojave woodyaster brittlebush Parish's goldeneye bastardsage creosote bush desert needlegrass Eastern Mojave buckwheat white ratany wishbone-bush California fagonbush desert trumpet Mexican bladdersage	9 9 5 4 3 2 1 1 1 1 1 1 1
1255: Goldenhills - 40%	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush creosote bush California fagonbush pincushion flower cryptantha desert Indianwheat low woollygrass Schott's dalea white bursage	15 4 2 2 1 1
Bulletproof - 15%	Hyperthermic Steep North Slopes (R030XD040CA)	other annual forbs white bursage sweetbush Parish's goldeneye smooth desertdandelion bastardsage brittlebush curvenut combseed brownplume wirelettuce creosote bush desert trumpet Eastern Mojave buckwheat Mojave woodyaster narrowleaf bedstraw other shrubs red brome white ratany wishbone-bush	6 6 4 3 3 2 2 2 1 1 1 1 1 1 1 1 1 1
Fanhill - 15%-----	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush creosote bush California fagonbush pincushion flower cryptantha desert Indianwheat low woollygrass Schott's dalea white bursage	15 4 2 2 1 1



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
1255:			
Whiterobe - 15%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush	15
		creosote bush	4
		California fagonbush	2
		pincushion flower	2
		cryptantha	1
		desert Indianwheat	1
		low woollygrass	
		Schott's dalea	
		white bursage	
1260:			
Whiterobe - 45%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush	15
		creosote bush	4
		California fagonbush	2
		pincushion flower	2
		cryptantha	1
		desert Indianwheat	1
		low woollygrass	
		Schott's dalea	
		white bursage	
Bigbernie - 20%---	Moderately Deep Gravelly Mountain Slopes (R030XB213CA)	California juniper	7
		wishbone-bush	6
		annual grasses	5
		annual forbs	5
		red brome	5
		Parish's goldeneye	4
		bastardsage	3
		big galleta	2
		blackbrush	1
		desert needlegrass	1
		Eastern Mojave buckwheat	1
		green rabbitbrush	1
		Mojave sage	1
		Mojave woodyaster	1
		Mojave yucca	1
		Parry's beargrass	1
Whiterobe, cool - 15%-----	Hyperthermic Steep North Slopes (R030XD040CA)	other annual forbs	6
		white bursage	6
		sweetbush	4
		Parish's goldeneye	3
		smooth desertdandelion	3
		bastardsage	2
		brittlebush	2
		curvenut combseed	2
		brownplume wirelettuce	1
		creosote bush	1
		desert trumpet	1
		Eastern Mojave buckwheat	1
		Mojave woodyaster	1
		narrowleaf bedstraw	1
		other shrubs	1
		red brome	1
		white ratany	1
		wishbone-bush	1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
1410:			
Missionwell - 50%	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush creosote bush California fagonbush pincushion flower cryptantha desert Indianwheat low woollygrass Schott's dalea white bursage	15 4 2 2 1 1    
Missionwell, high elevation - 15%	Hyperthermic Dry Hills (R030XD001CA)	smooth desertdandelion creosote bush desert Indianwheat white bursage pepperweed	12 10 7 3  
1415:			
Bolero - 60%	Hyperthermic Dry Hills (R030XD001CA)	curvenut combseed creosote bush desert Indianwheat cryptantha white bursage bristly fiddleneck brittlebush California barrel cactus sowthistle desertdandelion	13 5 3 1 1    
1504:			
Rizzo, rarely flooded, stony - 50%	Cobbly Fan Remnants (R031XY201CA)	brittlebush sowthistle desertdandelion creosote bush chia curvenut combseed California fagonbush purple threeawn buckwheat common Mediterranean grass beavertail pricklypear California barrel cactus Engelmann's hedgehog cactus lupine New Mexico silverbush	5 5 4 3 3 2 2 1 1    
Rizzo, occasionally flooded, stony - 35%	Stony, Occasionally Flooded Ephemeral Stream (R031XY202CA)	blue paloverde Schott's dalea chia bristly fiddleneck buckwheat curvenut combseed desert lavender purple threeawn red brome sixweeks grama brownplume wirelettuce California barrel cactus common Mediterranean grass Parry's false pararie-flower	12 6 2 1 1 1 1 1 1 1    

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1510: Carrizo, very gravelly sandy loam - 85%-----	Hyperthermic Fans (R030XD015CA)	creosote bush   white bursage   white ratany   buckwheat   devil's spineflower   Mediterranean grass   pricklypear   spurge	4 1 1       
1511: Carrizo, channeled - 75%--	Flooded Gravelly Fans (R030XY038CA)	cryptantha   creosote bush   curvenut combseed   spineflower   desertsenna   Schott's dalea   smooth desertdandelion   whitemargin sandmat   bristly fiddleneck   white bursage   buckwheat   chia   desert lavender   jojoba   Mediterranean grass   Mojave desertstar	11 9 9 7 5 5 2 2 1 1        
Carrizo, occasionally flooded - 15%----	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)	creosote bush   white bursage   brittlebush   brownplume wirelettuce   Schott's dalea   beavertail pricklypear   buckwheat   California barrel cactus   desert Indianwheat   sixweeks grama   Wiggin's cholla	4 3 1 1 1       
1512: Carizzo, extremely gravelly sandy loam - 80%-----	Hyperthermic Fans (R030XD015CA)	creosote bush   white bursage   white ratany   buckwheat   devil's spineflower   Mediterranean grass   pricklypear   spurge	4 1 1       

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1513:			
Carrizo - 60%----	Dry Deep Sandy Fan Aprons (R030XD006CA)	creosote bush cryptantha desert Indianwheat smooth desertdandelion white bursage	4 1 1 1
Carrizo, occasionally flooded, channeled - 20%--	Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)	catclaw acacia burrobrush desert almond curvenut combseed jojoba Mojave yucca white ratany Asian Mustard bladderpod spiderflower bristly fiddleneck coyote gourd creosote bush mistletoe redstem stork's bill sowthistle desertdandelion sweetbush wishbone-bush	10 6 4 3 3 2 2 1 1 1 1 1 1 1 1 1 1
Rubylee - 15%----	Desert Patina (R030XY002CA)	creosote bush desert Indianwheat pincushion flower cryptantha desert marigold hairy desertsunflower low woollygrass Mediterranean grass smooth desertdandelion white bursage	1 1 1 1 1 1 1 1 1 1
1514:			
Carrizo, rarely flooded - 40%----	Hyperthermic Fans (R030XD015CA)	creosote bush white bursage white ratany buckwheat devil's spineflower Mediterranean grass pricklypear spurge	4 1 1 1 1 1 1 1
Pintobasin, fine sandy loam - 30%	Dry Deep Sandy Fan Aprons (R030XD006CA)	creosote bush cryptantha desert Indianwheat smooth desertdandelion white bursage	4 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1514: Rubylee - 15%----	Desert Patina (R030XY002CA)	creosote bush desert Indianwheat pincushion flower cryptantha desert marigold hairy desertsunflower low woollygrass Mediterranean grass smooth desertdandelion white bursage	1 1 1
1515: Pintobasin - 80%	Dry Deep Sandy Fan Aprons (R030XD006CA)	creosote bush cryptantha desert Indianwheat smooth desertdandelion white bursage	4 1 1 1
Carrizo, occasionally flooded - 15%----	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)	creosote bush white bursage brittlebush brownplume wirelettuce Schott's dalea beavertail pricklypear buckwheat California barrel cactus desert Indianwheat sixweeks grama Wiggin's cholla	4 3 1 1 1
1516: Pintobasin, fine sandy loam - 90%	Dry Deep Sandy Fan Aprons (R030XD006CA)	desert Indianwheat hairy desertsunflower smooth desertdandelion suncup creosote bush Mediterranean grass Panamint crptantha pincushion flower white bursage	8 5 4 3 2 1 1 1
1517: Pintobasin - 65%--	Dry Deep Sandy Fan Aprons (R030XD006CA)	creosote bush cryptantha desert Indianwheat smooth desertdandelion white bursage	4 1 1 1
Dalelake - 25%----	Hyperthermic Sandsheets (R030XD025CA)	Asian Mustard common Mediterranean grass creosote bush white bursage big galleta	11 9 8 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1520: Pintobasin, loamy sand - 80%-----	Hyperthermic Fans (R030XD015CA)	creosote bush   buckwheat   branched pencil cholla   pincushion flower   smooth desertdandelion   white bursage	4 2 1 1 1 1
1522: Pintobasin, rarely flooded - 85%----	Hyperthermic Fans (R030XD015CA)	creosote bush   sowthistle desertdandelion   white bursage   pincushion   curvenut combseed   Mediterranean grass   pincushion flower   Asian Mustard   bristly fiddleneck   desert Indianwheat   devil's spineflower	13 7 3 2 1 1 1 1 1 1
1523: Pintobasin, rarely flooded - 50%----	Hyperthermic Fans (R030XD015CA)	cryptantha   creosote bush   smooth desertdandelion   white bursage   white ratany   big galleta   desert Indianwheat   pincushion flower   small wirelettuce   Wiggin's cholla	9 6 5 3 1
Aquapeak - 25%----	Desert Patina (R030XY002CA)	creosote bush   cryptantha   grass, perennial   sowthistle desertdandelion   white bursage	
Pintobasin, occasionally flooded - 20%----	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)	creosote bush   white bursage   brittlebush   brownplume wirelettuce   Schott's dalea   beavertail pricklypear   buckwheat   California barrel cactus   desert Indianwheat   sixweeks grama   Wiggin's cholla	4 3 1 1 1



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1524: Pintobasin, flooded - 90%----	Hyperthermic Fans (R030XD015CA)	creosote bush   white bursage   smooth desertdandelion   cryptantha   annual forbs   Mediterranean grass   pincushion flower   buckwheat   suncup   white ratany	6   4   2   1   1   1   1   1
1525: Pintobasin, occasionally flooded - 45%----	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream (R030XY001CA)	creosote bush   white bursage   brittlebush   brownplume wirelettuce   Schott's dalea   beavertail pricklypear   buckwheat   California barrel cactus   desert Indianwheat   sixweeks grama   Wiggin's cholla	4   3   1   1   1
Pintobasin, rarely flooded - 35%----	Hyperthermic Fans (R030XD015CA)	creosote bush   burrobrush   white bursage   white ratany   branched pencil cholla   cryptantha   desert Indianwheat   Schott's dalea   Wiggin's cholla	3   1   1   1
1526: Pintobasin, rarely flooded - 55%----	Hyperthermic Fans (R030XD015CA)	creosote bush   Mediterranean grass   Panamint crptantha   Asian Mustard   desert Indianwheat   annual forbs   pincushion flower   white bursage	6   5   4   2   2   1   1   1
Joetree - 20%----	Hyperthermic Fans (R030XD015CA)	creosote bush   desert Indianwheat   big galleta   white bursage   cryptantha   gilia   sowthistle desertdandelion   lupine	6   3   2   2   1   1   1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1526: Patscamp - 15%----	Hyperthermic Fans (R030XD015CA)	creosote bush desert Indianwheat big galleta white bursage cryptantha gilia sowthistle desertdandelion lupine	6 3 2 2 1 1 1
1527: Pintobasin, moist - 90%-----	Coarse Gravelly Fans (R030XD039CA)	brittlebush white bursage creosote bush annual grasses big galleta cryptantha teddybear cholla Wiggin's cholla California barrel cactus desert lavender sowthistle desertdandelion	19 3 2 1 1 1 1 1
1530: Dalelake, fine sand - 85%-----	Hyperthermic Sandsheets (R030XD025CA)	Mediterranean grass smooth desertdandelion creosote bush Asian Mustard pincushion flower evening-primrose Panamint crptantha	17 11 4 2 2 1 1
1531: Dalelake - 60%----	Hyperthermic Sandsheets (R030XD025CA)	Asian Mustard desert Indianwheat sowthistle desertdandelion big galleta creosote bush Mediterranean grass bristly fiddleneck cryptantha dyebush pincushion flower smooth desertdandelion white bursage	5 4 4 3 3 3 1 1 1 1 1 1
Pintobasin, rarely flooded - 30%----	Hyperthermic Fans (R030XD015CA)	cryptantha creosote bush smooth desertdandelion white bursage white ratany big galleta desert Indianwheat pincushion flower small wirelettuce Wiggin's cholla	9 6 5 3 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1540: Carrizo, very rarely flooded - 35%-----	Coarse Gravelly Fans (R030XD039CA)	cryptantha creosote bush smooth desertdandelion brittlebush beavertail pricklypear annual forbs catclaw acacia desert Indianwheat	9 5 4 2 1 1
Carrizo, stable - 25%-----	Desert Patina (R030XY002CA)	sowthistle desertdandelion brittlebush creosote bush desertholly birdcage evening primrose desert Indianwheat	3 1 1 1
Carrizo, occasionally flooded, rocky surface - 20%----	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream (R030XY021CA)	brittlebush sweetbush cryptantha creosote bush white ratany smooth desertdandelion Abrams' sandmat desertholly desert Indianwheat pepperweed	15 10 8 6 4 2 1 1
Russiroks - 20%---	Desert Patina (R030XY002CA)	smooth desertdandelion desert Indianwheat creosote bush	3 2 1
1541: Carrizo, stable - 50%-----	Desert Patina (R030XY002CA)	creosote bush desert Indianwheat desert marigold annual forbs	1
Cambidic Haplodurids - 40%	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	sowthistle desertdandelion creosote bush desert Indianwheat cryptantha devil's spineflower annual forbs Mojave desertstar redroot cryptantha	3 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1542: Carrizo, very rarely flooded - 70%-----	Coarse Gravelly Fans (R030XD039CA)	brittlebush white bursage creosote bush annual grasses big galleta cryptantha teddybear cholla Wiggin's cholla California barrel cactus desert lavender sowthistle desertdandelion	19 3 2 1 1 1 1 1
Carrizo, occasionally flooded - 20%----	Broad, Gravelly, Hyperthermic Ephemeral Stream (R030XY128CA)	burrobrush sowthistle desertdandelion brittlebush Schott's dalea smooth desertdandelion	11 4 2 1 1
1550: Buzzardsprings, stable - 35%-----	Desert Patina (R030XY002CA)	creosote bush desert Indianwheat pincushion flower cryptantha desert marigold hairy desertsunflower low woollygrass Mediterranean grass smooth desertdandelion white bursage	1 1 1
Coxpin - 25%-----	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	pincushion cryptantha Asian Mustard creosote bush white bursage Abrams' sandmat brownplume wirelettuce common Mediterranean grass desert Indianwheat desert marigold lupine small wirelettuce	13 11 1 1 1
Dalelake - 20%----	Hyperthermic Sandsheets (R030XD025CA)	Asian Mustard desert Indianwheat sowthistle desertdandelion big galleta creosote bush Mediterranean grass bristly fiddleneck cryptantha dyebush pincushion flower smooth desertdandelion white bursage	5 4 4 3 3 3 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
1555: Goldrose - 35%----	Rarely Flooded Fans (R031XY200CA)	creosote bush buckwheat brittlebush sowthistle desertdandelion big galleta blue paloverde chia cryptantha desert ironwood	7 3 1 1
Carsitas, very rarely flooded - 30%-----	Rarely Flooded Fans (R031XY200CA)	white bursage cryptantha creosote bush brittlebush annual grasses Asian Mustard desert Indianwheat lupine pincushion flower smooth desertdandelion chia	5 4 3 2 1 1 1 1 1 1
Chemwash, rarely flooded - 25%----	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	sowthistle desertdandelion creosote bush white bursage brittlebush cryptantha sweetbush	12 4 2 1
2003: Emptygun - 100%---	Steep South Slope 2-4" p.z. (R031XY003CA)	sowthistle desertdandelion desert Indianwheat cryptantha creosote bush brittlebush purple threeawn buckwheat devil's spineflower Parry's false pararie-flower white ratany	10 9 5 3 2 2 1 1 1 1
2060: Joetree, very rarely flooded - 35%-----	Dry Deep Sandy Fan Aprons (R030XD006CA)	creosote bush cryptantha desert Indianwheat smooth desertdandelion white bursage	4 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2060:			
Dalelake - 30%----	Hyperthermic Sandsheets (R030XD025CA)	Asian Mustard	5
		desert Indianwheat	4
		sowthistle desertdandelion	4
		big galleta	3
		creosote bush	3
		Mediterranean grass	3
		bristly fiddleneck	1
		cryptantha	1
		dyebush	1
		pincushion flower	1
		smooth desertdandelion	1
		white bursage	1
Pintobasin, fine sandy loam - 25%	Dry Deep Sandy Fan Aprons (R030XD006CA)	creosote bush	4
		cryptantha	1
		desert Indianwheat	1
		smooth desertdandelion	1
		white bursage	
2065:			
Dalelake - 30%----	Hyperthermic Sandsheets (R030XD025CA)	Asian Mustard	5
		desert Indianwheat	4
		sowthistle desertdandelion	4
		big galleta	3
		creosote bush	3
		Mediterranean grass	3
		bristly fiddleneck	1
		cryptantha	1
		dyebush	1
		pincushion flower	1
		smooth desertdandelion	1
		white bursage	1
Aquapeak - 25%----	Desert Patina (R030XY002CA)	creosote bush	1
		cryptantha	
		grass, perennial	
		sowthistle desertdandelion	
		white bursage	
Coxpin - 25%-----	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	smooth desertdandelion	3
		creosote bush	2
		desert Indianwheat	2
		cryptantha	1
		white bursage	1
		white ratany	
2067:			
Aquapeak, overblown - 30%--	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	smooth desertdandelion	3
		creosote bush	2
		desert Indianwheat	2
		cryptantha	1
		white bursage	1
		white ratany	



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2067:			
Buzzardsprings -			
25%-----	Hyperthermic Fans (R030XD015CA)	creosote bush	6
		desert Indianwheat	3
		big galleta	2
		white bursage	2
		cryptantha	1
		gilia	1
		sowthistle desertdandelion	1
		lupine	
Dalelake, thick			
sandy surface -			
20%-----	Hyperthermic Sandy Plains (R030XD014CA)	big galleta	15
		Asian Mustard	3
		creosote bush	2
		chuckwalla combseed	1
		desert Indianwheat	1
		annual forbs	1
		Mediterranean grass	1
		Panamint crptantha	1
		pincushion flower	1
		smooth desertdandelion	1
		birdcage evening primrose	
Buzzardsprings,			
steep - 15%-----	Hyperthermic Dry Hills (R030XD001CA)	creosote bush	11
		curvenut combseed	6
		desert Indianwheat	3
		water jacket	2
		white bursage	2
		cryptantha	1
		brittlebush	
		smooth desertdandelion	
2068:			
Aquapeak - 45%----	Desert Patina (R030XY002CA)	pincushion flower	7
		desert Indianwheat	4
		creosote bush	3
		cryptantha	1
		hairy desertsunflower	1
		Mediterranean grass	1
Carpetflat,			
nongravelly			
surface - 35%----	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	smooth desertdandelion	3
		creosote bush	2
		desert Indianwheat	2
		cryptantha	1
		white bursage	1
		white ratany	
Pintobasin - 15%--	Dry Deep Sandy Fan Aprons (R030XD006CA)	creosote bush	4
		cryptantha	1
		desert Indianwheat	1
		smooth desertdandelion	1
		white bursage	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2070:			
Missionsweet - 60%	Low-Production Hyperthermic Hills (R030XD004CA)	creosote bush	2
		desert Indianwheat	2
		pincushion flower	2
		curvenut combseed	1
		sowthistle desertdandelion	1
		cryptantha	
Carpetflat - 25%	Desert Patina (R030XY002CA)	creosote bush	1
		desert Indianwheat	1
		pincushion flower	1
		cryptantha	
		desert marigold	
		hairy desertsunflower	
		low woollygrass	
		Mediterranean grass	
		smooth desertdandelion	
		white bursage	
2075:			
Oldale - 50%	Desert Patina (R030XY002CA)	creosote bush	1
		desert Indianwheat	1
		pincushion flower	1
		cryptantha	
		desert marigold	
		hairy desertsunflower	
		low woollygrass	
		Mediterranean grass	
		smooth desertdandelion	
		white bursage	
Missionsweet - 30%	Low-Production Hyperthermic Hills (R030XD004CA)	creosote bush	2
		desert Indianwheat	2
		pincushion flower	2
		cryptantha	1
		curvenut combseed	1
		sowthistle desertdandelion	1
2076:			
Oldale - 40%	Desert Patina (R030XY002CA)	creosote bush	1
		desert Indianwheat	1
		pincushion flower	1
		cryptantha	
		desert marigold	
		hairy desertsunflower	
		low woollygrass	
		Mediterranean grass	
		smooth desertdandelion	
		white bursage	
Carrizo - 30%	Dry Deep Sandy Fan Aprons (R030XD006CA)	creosote bush	4
		cryptantha	1
		desert Indianwheat	1
		smooth desertdandelion	1
		white bursage	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
2077:			
Oldale - 50%-----	Desert Patina (R030XY002CA)	creosote bush	1
		desert Indianwheat	1
		pincushion flower	1
		cryptantha	
		desert marigold	
		hairy desertsunflower	
		low woollygrass	
		Mediterranean grass	
		smooth desertdandelion	
		white bursage	
Carrizo - 25%-----	Dry Deep Sandy Fan Aprons (R030XD006CA)	creosote bush	4
		cryptantha	1
		desert Indianwheat	1
		smooth desertdandelion	1
		white bursage	
Carrizo, very rarely flooded - 15%-----	Coarse Gravelly Fans (R030XD039CA)	creosote bush	8
		brittlebush	3
		sowthistle desertdandelion	2
		cryptantha	1
		Asian Mustard	
2085:			
Rainbowsend - 45%	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush	15
		creosote bush	4
		California fagonbush	2
		pincushion flower	2
		cryptantha	1
		desert Indianwheat	1
		low woollygrass	
		Schott's dalea	
		white bursage	
Goldenbell - 35%--	Desert Patina (R030XY002CA)	creosote bush	1
		desert Indianwheat	1
		pincushion flower	1
		cryptantha	
		desert marigold	
		hairy desertsunflower	
		low woollygrass	
		Mediterranean grass	
		smooth desertdandelion	
		white bursage	
2090:			
Deprave - 35%-----	Desert Pavement 2-4" p.z. (R031XY002CA)	brittlebush	1
		creosote bush	1
		sowthistle desertdandelion	1
		desert Indianwheat	
		Parry's false pararie-flower	
Rockhound - 25%--	Desert Pavement 2-4" p.z. (R031XY002CA)	creosote bush	3
		brittlebush	2
		desert Indianwheat	1
		Schott's dalea	1
		sowthistle desertdandelion	1
		teddybear cholla	1
		blue paloverde	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
2090:			
Rizzo - 20%-----	Gravelly Fan Remnants And Fan Aprons (R031XY009CA)	desert Indianwheat	13
		sowthistle desertdandelion	9
		creosote bush	5
		Schott's dalea	3
		brittlebush	2
		paleface	1
		cushion foxtail cactus	
2091:			
Deprave - 60%-----	Desert Pavement 2-4" p.z. (R031XY002CA)	brittlebush	1
		creosote bush	1
		sowthistle desertdandelion	1
		desert Indianwheat	
		Parry's false pararie-flower	
Roostertail - 15%	Limy 2-4" p.z. (R031XY006CA)	desert Indianwheat	5
		creosote bush	4
		white ratany	2
		white bursage	1
		big galleta	
		other shrubs	
		sixweeks threeawn	
2100:			
Perurose - 50%----	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	smooth desertdandelion	6
		desert Indianwheat	4
		creosote bush	3
		annual forbs	1
		white bursage	1
		white ratany	1
		branched pencil cholla	
		cane bluestem	
		cryptantha	
		low woollygrass	
Coxpin - 25%-----	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	desert trumpet	11
		desert palafox	8
		Asian Mustard	1
		big galleta	1
		creosote bush	1
Pintobasin, gravelly surface - 15%----	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	smooth desertdandelion	3
		creosote bush	2
		desert Indianwheat	2
		cryptantha	1
		white bursage	1
		white ratany	
2101:			
Perurose, rarely flooded - 60%----	Hyperthermic Fans (R030XD015CA)	creosote bush	6
		desert Indianwheat	3
		big galleta	2
		white bursage	2
		cryptantha	1
		gilia	1
		sowthistle desertdandelion	1
		lupine	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2101: Pintobasin, rarely flooded - 35%----	Hyperthermic Fans (R030XD015CA)	creosote bush white bursage big galleta desert Indianwheat popcornflower cryptantha desert palafox manybristle cinchweed white ratany	8 2 1 1 1
2110: Descent - 80%----	Low-Production Hyperthermic Hills (R030XD004CA)	desert Indianwheat sowthistle desertdandelion creosote bush annual forbs	3 3 1
Descent, stable - 15%-----	Desert Patina (R030XY002CA)	creosote bush desert Indianwheat pincushion flower cryptantha desert marigold hairy desertsunflower low woollygrass Mediterranean grass smooth desertdandelion white bursage	1 1 1
2111: Descent, warm - 45%-----	Hyperthermic Steep South Slopes (R030XD003CA)	desert Indianwheat brittlebush California fagonbush cryptantha sowthistle desertdandelion lupine	6 5 1 1 1
Rubylee, very rarely flooded - 40%-----	Coarse Gravelly Fans (R030XD039CA)	desert Indianwheat creosote bush brittlebush cryptantha California fagonbush annual forbs smooth desertdandelion suncup	10 4 3 3 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2120: Rizzo, rarely flooded - 35%----	Rarely Flooded Fans (R031XY200CA)	cryptantha creosote bush sowthistle desertdandelion brittlebush birdcage evening primrose brittle spineflower desert Indianwheat annual forbs	15 3 2 1
Deprave - 35%-----	Desert Pavement 2-4" p.z. (R031XY002CA)	creosote bush brittlebush other annual forbs white ratany annual grasses big galleta desert Indianwheat desert trumpet ocotillo other shrubs Parry's false pararie-flower Schott's dalea white bursage	2 1 1 1
Rizzo, frequently flooded - 20%----	Frequently Flooded, Confined Ephemeral Stream (R031XY029CA)	desert ironwood creosote bush sowthistle desertdandelion white ratany cryptantha desert Indianwheat big galleta Asian Mustard buckwheat	16 8 4 4 3 3 2
2121: Rizzo, rubbly - 90%-----	Extremely Stony Fan Remnants (R031XY030CA)	teddybear cholla creosote bush Parry's false pararie-flower buckwheat sowthistle desertdandelion California fagonbush chia fiddleneck sweetbush brittlebush paleface California barrel cactus New Mexico silverbush purple threeawn sixweeks grama desert ironwood littleleaf ratany ocotillo	7 6 6 5 4 3 3 3 3 2 2 1 1 1 1 1



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2130: Goldenbell - 55%--	Desert Patina (R030XY002CA)	cryptantha  desert Indianwheat  low woollygrass  smooth desertdandelion	
Descent - 40%-----	Low-Production Hyperthermic Hills (R030XD004CA)	sowthistle desertdandelion  desert Indianwheat  creosote bush  cryptantha	15 3 1
2140: Rockbound, cobbly - 85%-----	Cobbly Fan Remnants (R031XY201CA)	brittlebush  sowthistle desertdandelion  creosote bush  chia  curvenut combseed  California fagonbush  purple threeawn  buckwheat  common Mediterranean grass  beavertail pricklypear  California barrel cactus  Engelmann's hedgehog cactus  lupine  New Mexico silverbush	5 5 4 3 3 2 2 1 1
2402: Rizzo - 70%-----	Gravelly Fan Remnants And Fan Aprons (R031XY009CA)	pincushion flower  creosote bush  brittlebush  buckwheat  desert Indianwheat  brittle spineflower  California fagonbush  sandmat  lupine  ocotillo  sixweeks threeawn  smooth desertdandelion  trefoil  white bursage  Wiggin's cholla	5 4 3 3 2 1 1 1
Rizzo, frequently flooded - 20%----	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	burrobrush  desert lavender  smoketree  sweetbush  blue paloverde  ghost flower  smooth desertdandelion	1 1 1 1
2403: Rizzo - 80%-----	Gravelly Fan Remnants And Fan Aprons (R031XY009CA)	desert Indianwheat  Schott's dalea  creosote bush  sowthistle desertdandelion  purple threeawn  white bursage	5 5 4 2

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
2403: Rizzo, occasionally flooded - 15%----	Coarse Gravelly Wash (R031XY019CA)	brittlebush  creosote bush  catclaw acacia  blue paloverde  desert lavender  burrobrush  New Mexico silverbush  Schott's dalea  whitemargin sandmat  big galleta  sweetbush  water jacket  white bursage  white ratany	8 8 5 2 2 1 1 1 1      
2404: Rizzo, occasionally flooded - 60%----	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	burrobrush  desert lavender  blue paloverde  brittlebush  cryptantha  Schott's dalea	6 2 1 1 1 1
Rizzo, very rarely flooded- 35%-----	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	sowthistle desertdandelion  creosote bush  white bursage  brittlebush  cryptantha  sweetbush	12 4 2 1  
2405: Carrizo, rarely flooded - 65%----	Hyperthermic Fans (R030XD015CA)	creosote bush  white bursage  white ratany  buckwheat  devil's spineflower  Mediterranean grass  pricklypear  spurge	4 1 1     

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
2405: Carrizo, occasionally flooded - 25%----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	burrobrush  catclaw acacia  creosote bush  Asian Mustard  birdcage evening primrose  bladderpod spiderflower  branched pencil cholla  bristly fiddleneck  coyote gourd  curvenut combseed  distant phacelia  redstem stork's bill  smooth desertdandelion  sowthistle desertdandelion  brittle spineflower  chia  cryptantha  desert Indianwheat  devil's spineflower  lacy phacelia  Mediterranean grass  pepperweed  redroot cryptantha  smoketree  suncup  white ratany  wishbone-bush	10 5 3 1 1 1 1 1 1 1 1 1 1 1
2406: Pintobasin, frequently flooded - 50%----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	catclaw acacia  burrobrush  smoketree  sweetbush  bristly fiddleneck  brittle spineflower  creosote bush  cryptantha  desert thorn-apple  Eschscholzia poppy  lupine  monkeyflower  Phacelia  redstem stork's bill  small wirelettuce	6 3 2 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

<div>Map unit symbol, soil name, and local phase and percent of map unit</div>	<div>Ecological site</div>	<div>Characteristic vegetation</div>	<div>Canopy cover</div>
			Pct
2406: <div>Carrizo, occasionally flooded - 40%----</div>	Frequently Flooded, Gravelly,	burrobrush	8
	Hyperthermic To Warm-Thermic	smooth desertdandelion	8
	Ephemeral Stream (R030XY010CA)	buckwheat	3
		creosote bush	3
		cryptantha	3
		Schott's dalea	3
		catclaw acacia	2
		distant phacelia	2
		bladderpod spiderflower	1
		bristly fiddleneck	1
		chia	1
		curvenut combseed	1
		annual forbs	1
		hairry milkweed	1
		pincushion flower	1
		sweetbush	1
		redstem stork's bill	
		small wirelettuce	
		Wiggin's cholla	
2407:			
<div>Pintobasin, rarely flooded - 45%----</div>	Hyperthermic Fans (R030XD015CA)	cryptantha	9
		creosote bush	6
		smooth desertdandelion	5
		white bursage	3
		white ratany	1
		big galleta	
		desert Indianwheat	
		pincushion flower	
		small wirelettuce	
		Wiggin's cholla	
<div>Carrizo, occasionally flooded - 30%----</div>	Frequently Flooded, Gravelly,	burrobrush	8
	Hyperthermic To Warm-Thermic	smooth desertdandelion	8
	Ephemeral Stream (R030XY010CA)	buckwheat	3
		creosote bush	3
		cryptantha	3
		Schott's dalea	3
		catclaw acacia	2
		distant phacelia	2
		bladderpod spiderflower	1
		bristly fiddleneck	1
		chia	1
		curvenut combseed	1
		annusl forbs	1
		hairry milkweed	1
		pincushion flower	1
		sweetbush	1
		redstem stork's bill	
		small wirelettuce	
		Wiggin's cholla	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2407: Carrizo, frequently flooded - 20%----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	burrobrush  hairy milkweed  brittle spineflower  buckwheat  catclaw acacia  annual forbs  smoketree  western tansymustard  bladderpod spiderflower  branched pencil cholla  chia  cryptantha  Mediterranean grass  purplemat  redstem stork's bill  smooth desertdandelion  Wiggin's cholla	8 4 3 2 2 1 1 1
2408: Rizzo, occasionally flooded - 55%----	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	burrobrush  desert lavender  desert ironwood  other annual forbs  blue paloverde  distant phacelia  bristly fiddleneck  catclaw acacia  pygmy poppy  smoketree  smooth desertdandelion  sweetbush  brownplume wirelettuce	4 4 3 3 2 2 1 1 1 1 1 1
Rizzo, very rarely flooded - 35%----	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	brittlebush  Schott's dalea  cryptantha  blue paloverde  desert lavender  Mediterranean grass  creosote bush  distant phacelia  smooth desertdandelion  white bursage  branched pencil cholla  wishbone-bush	18 10 3 2 2 2 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2409: Rizzo, frequently flooded - 35%----	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	burrobrush  desert lavender  desert ironwood  other annual forbs  blue paloverde  distant phacelia  bristly fiddleneck  catclaw acacia  pygmy poppy  smoketree  smooth desertdandelion  sweetbush  brownplume wirelettuce	4 4 3 3 2 2 1 1 1 1 1 1 1
Chemwash, frequently flooded - 30%----	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	smoketree  buckwheat  desert lavender  burrobrush  sweetbush  chia	14 3 3 2 2 1
Carsitas, occasionally flooded - 25%----	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	burrobrush  buckwheat  brittle spineflower  brittlebush  curvenut combseed  bladderpod spiderflower  blue paloverde  desert ironwood  redstem stork's bill  chia  Parry's wirelettuce	6 5 3 3 2 1 1 1 1 1
2420: Carsitas, frequently flooded - 45%----	Valley Wash (R031XY010CA)	desert willow  Asian Mustard  burrobrush  smoketree  blue paloverde  common Mediterranean grass  Panamint crptantha  Parish's goldeneye  pincushion flower  smooth desertdandelion  sowthistle desertdandelion  desert Indianwheat  annual forbs	12 11 6 5 4 3 1 1 1 1 1 1



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2420: Carsitas, occasionally flooded - 40%----	Valley Wash (R031XY010CA)	blue paloverde  burrobrush  creosote bush  distant phacelia  Schott's dalea  Asian Mustard  desert lavender  purple threeawn  pygmy poppy	9 9 5 4 1
Carsitas, rarely flooded - 15%----	Coarse Gravelly Wash (R031XY019CA)	brittlebush  creosote bush  catclaw acacia  blue paloverde  desert lavender  burrobrush  New Mexico silverbush  Schott's dalea  whitemargin sandmat  big galleta  sweetbush  water jacket  white bursage  white ratany	8 8 5 2 2 1 1 1 1 1
2421: Carsitas, very rarely flooded - 55%-----	Rarely Flooded Fans (R031XY200CA)	white bursage  cryptantha  creosote bush  brittlebush  annual grasses  Asian Mustard  desert Indianwheat  lupine  pincushion flower  smooth desertdandelion  chia	5 4 3 2 1 1 1 1 1 1
Carsitas, rarely flooded - 25%----	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	brittlebush  Schott's dalea  chia  blue paloverde  brittle spineflower  buckwheat  creosote bush  cryptantha  curvenut combseed  desert lavender  Mediterranean grass  burrobrush	9 3 2 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2431: Chemwash, frequently flooded, braided - 60%----	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	burrobrush desert lavender brittlebush buckwheat annual forbs hairy milkweed Parry's wirelettuce redstem stork's bill smooth desertdandelion suncup chia cryptantha	46 37 17 2 2 2 2 2 2 2 1 1
Chemwash, frequently flooded - 25%----	Large, High Intensity, Frequently Flooded Ephemeral Stream (R031XY026CA)	smoketree buckwheat desert lavender burrobrush sweetbush chia	14 3 3 2 2 1
2440: Rizzo - 35%-----	Gravelly Fan Remnants And Fan Aprons (R031XY009CA)	desert Indianwheat sowthistle desertdandelion creosote bush Schott's dalea brittlebush paleface cushion foxtail cactus	13 9 5 3 2 1
Rizzo, occasionally flooded - 30%----	Gravelly, Braided, Ephemeral Stream (R031XY034CA)	blue paloverde desert lavender brittlebush chia California fagonbush creosote bush cryptantha fiddleneck lupine ocotillo Schott's pygmycedar sweetbush desert globemallow	13 9 6 2 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2440: Rizzo, extremely stony - 15%-----	Extremely Stony Fan Remnants (R031XY030CA)	teddybear cholla creosote bush Parry's false pararie-flower buckwheat sowthistle desertdandelion California fagonbush chia fiddleneck sweetbush brittlebush paleface California barrel cactus New Mexico silverbush purple threeawn sixweeks grama desert ironwood littleleaf ratany ocotillo	7 6 6 5 4 3 3 3 3 2 2 1 1 1 1 1
2715: Dalelake - 35%----	Hyperthermic Sandsheets (R030XD025CA)	sowthistle desertdandelion Asian Mustard big galleta creosote bush dyebrush bristly fiddleneck buckwheat cryptantha white bursage	10 5 3 2 1
Sheephole - 30%---	Hyperthermic Sandy Plains (R030XD014CA)	big galleta Asian Mustard creosote bush desert needlegrass chuckwalla combseed desert Indianwheat annual forbs Great Basin langloisia Mediterranean grass Panamint crptantha pincushion flower smooth desertdandelion birdcage evening primrose	6 3 2 2 1 1 1 1 1 1 1 1
Pintobasin - 25%--	Dry Deep Sandy Fan Aprons (R030XD006CA)	Asian Mustard creosote bush cryptantha annual forbs	5 2 1
2716: Dalelake, steep - 75%-----	Hyperthermic Sandhill (R030XD008CA)	big galleta Asian Mustard creosote bush annual forbs birdcage evening primrose dyebrush white bursage California croton desert palafox white ratany	6 5 4 2 1 1 1

Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2716: Dalelake - 20%----	Hyperthermic Sandsheets (R030XD025CA)	Asian Mustard desert Indianwheat sowthistle desertdandelion big galleta creosote bush Mediterranean grass bristly fiddleneck cryptantha dyebush pincushion flower smooth desertdandelion white bursage	5 4 4 3 3 3 1 1 1 1 1 1
2717: Dalelake - 40%----	Hyperthermic Sandhill (R030XD008CA)	big galleta Asian Mustard creosote bush annual forbs birdcage evening primrose dyebush white bursage California croton desert palafox white ratany	6 5 4 2 1 1 1  1
Buzzardsprings, fine sand - 20%--	Hyperthermic Shallow to Moderately Deep Fan Remnants (R030XD042CA)	smooth desertdandelion creosote bush desert Indianwheat cryptantha white bursage white ratany	3 2 2 1 1
2718: Dalelake - 55%----	Hyperthermic Sandsheets (R030XD025CA)	desert Indianwheat creosote bush cryptantha dyebush pincushion flower sowthistle desertdandelion white bursage Asian Mustard blazingstar branched pencil cholla desert calico annual forbs Mediterranean grass redroot cryptantha	5 3 1 1 1 1 1  1
Sheephole, gravelly surface - 45%----	Hyperthermic Sandsheets (R030XD025CA)	bristly fiddleneck creosote bush cryptantha desert Indianwheat dyebush sowthistle desertdandelion white bursage birdcage evening primrose Mediterranean grass suncup	4 3 1 1 1 1 1 1  1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2820: Impedimenta - 25%	Hyperthermic Dissected Shallow Pediment (R030XD023CA)	Mojave indigobush Asian Mustard white bursage creosote bush desert Indianwheat desertsenna Parish's goldeneye white ratany brittle spineflower common Mediterranean grass desert trumpet distant phacelia littleleaf ratany Nevada jointfir other annual forbs pincushion flower water jacket California fagonbush dyebush Mojave woodyaster Nevada dalea	5 3 3 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1
2825: Supplymine - 25%	Low-Production Hyperthermic Hills (R030XD004CA)	creosote bush desert Indianwheat pincushion flower cryptantha curvenut combseed sowthistle desertdandelion	2 2 2 1 1 1
Bolero, dry - 15%	Low-Production Hyperthermic Hills (R030XD004CA)	creosote bush desert Indianwheat pincushion flower cryptantha curvenut combseed sowthistle desertdandelion	2 2 2 1 1 1
Ironage - 15%	Low-Production Hyperthermic Hills (R030XD004CA)	creosote bush desert Indianwheat pincushion flower cryptantha curvenut combseed sowthistle desertdandelion	2 2 2 1 1 1
2830: Blackeagle, cool - 10%	Low-Production Hyperthermic Hills (R030XD004CA)	creosote bush desert Indianwheat pincushion flower cryptantha curvenut combseed sowthistle desertdandelion	2 2 2 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
2835: Blackeagle - 40%--	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush creosote bush California fagonbush pincushion flower cryptantha desert Indianwheat low woollygrass Schott's dalea white bursage	15 4 2 2 1 1    
2840: Jadestorm - 30%---	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush creosote bush	  
3110: Coppermine, cool - 40%-----	Limy Hill 5-7" p.z. (R030XB140CA)	jojoba pincushion flower Hall's shrubby-spurge curvenut combseed desert globemallow white bursage white ratany annual grasses big galleta California fagonbush creosote bush cryptantha desert needlegrass Eastern Mojave buckwheat Mojave woodyaster Mojave yucca Nevada jointfir Parry's wirelettuce	4 4 3 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1
Stranger - 30%----	Warm Sloping Pediments (R030XB225CA)	Hall's shrubby-spurge pincushion flower curvenut combseed branched pencil cholla littleleaf ratany cryptantha desert needlegrass Eastern Mojave buckwheat Mojave yucca Nevada jointfir Parish's goldeneye Parry's wirelettuce white bursage desert globemallow jojoba redstem stork's bill Wiggin's cholla	10 5 4 2 2 1 1 1 1 1 1 1 1 1    



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
3120:			
Aguilareal - 40%--	Warm Gravelly Shallow Hills (R030XB172CA)	Parish's goldeneye	10
		creosote bush	7
		bristly fiddleneck	2
		Hall's shrubby-spurge	2
		Nevada jointfir	2
		red brome	2
		white bursage	2
		catclaw acacia	1
		chia	1
		cryptantha	1
		desert trumpet	1
		Eastern Mojave buckwheat	1
		jojoba	1
		Mojave yucca	1
		redstem stork's bill	1
		water jacket	1
		wishbone-bush	1
		big galleta	
		desert globemallow	
		desert needlegrass	
		littleleaf ratany	
		white ratany	
Blackeagle - 20%--	Hyperthermic Steep South Slopes (R030XD003CA)	brittlebush	15
		creosote bush	4
		California fagonbush	2
		pincushion flower	2
		cryptantha	1
		desert Indianwheat	1
		low woollygrass	
		Schott's dalea	
		white bursage	
3213:			
Dalvord - 35%-----	Limy Hill 3-5" P.Z. (R030XB139CA)	creosote bush	10
		white bursage	3
		desert globemallow	2
		jojoba	2
		red brome	2
		redstem stork's bill	2
		white ratany	2
		bristly fiddleneck	1
		chia	1
		annual forbs	1
		Mojave yucca	1
		wishbone-bush	1
		Nevada jointfir	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3213: Aguilareal - 30%--	Warm Gravelly Shallow Hills (R030XB172CA)	redstem stork's bill creosote bush brittlebush desert trumpet Hall's shrubby-spurge littleleaf ratany white bursage wishbone-bush Nevada jointfir Parish's goldeneye shrubby deervetch sweetbush big galleta desert globemallow Eastern Mojave buckwheat Engelmann's hedgehog cactus	5 4 2 2 2 2 2 2 1 1 1 1 1
3242: Langwell - 50%----	Warm Sloping Pediments (R030XB225CA)	Hall's shrubby-spurge white bursage redstem stork's bill creosote bush Parish's goldeneye California juniper jojoba Mediterranean grass Mojave woodyaster Mojave yucca Nevada jointfir branched pencil cholla cottontop cactus Eastern Mojave buckwheat Engelmann's hedgehog cactus littleleaf ratany narrowleaf bedstraw Parry's beargrass white ratany	6 6 3 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1
Helendale, cool - 20%-----	Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)	white bursage creosote bush chia cryptantha Hall's shrubby-spurge big galleta bristly fiddleneck jojoba Mojave yucca pincushion flower red brome redstem stork's bill branched pencil cholla grape soda lupine	8 7 4 4 3 2 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3285:			
Pinecity - 30%----	Shallow Cool Hills (R030XB189CA)	redstem stork's bill	15
		red brome	13
		blackbrush	5
		California juniper	4
		Parish's goldeneye	4
		Mojave yucca	3
		desert needlegrass	2
		Eastern Mojave buckwheat	2
		sweetbush	2
		Acton's brittlebush	1
		California jointfir	1
		desert globemallow	1
		Engelmann's hedgehog cactus	1
		narrowleaf goldenbush	1
		Nevada jointfir	1
		Virgin River brittlebush	1
		water jacket	1
		wishbone-bush	1
		shrubby deervetch	
Contactmine - 20%	Shallow Cool Hills (R030XB189CA)	blackbrush	20
		white bursage	4
		Mojave yucca	3
		water jacket	3
		redstem stork's bill	2
		creosote bush	1
		desert needlegrass	1
		needle grama	1
		Nevada jointfir	1
		Parish's goldeneye	1
		sixweeks grama	1
		whitemargin sandmat	1
		Wiggin's cholla	1
		big galleta	
		bristly fiddleneck	
		white ratany	
Desertqueen - 20%	Shallow Cool Hills (R030XB189CA)	blackbrush	10
		Parish's goldeneye	6
		California juniper	5
		redstem stork's bill	5
		water jacket	3
		desert needlegrass	2
		Eastern Mojave buckwheat	2
		Mojave yucca	2
		Nevada jointfir	2
		Parry's beargrass	2
		big galleta	1
		desert globemallow	1
		green rabbitbrush	1
		Mexican bladdersage	1
		red brome	1
		threadleaf snakeweed	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
3286: Pinecity, gravelly loamy sand - 85%	Shallow Cool Hills (R030XB189CA)	red brome blackbrush narrowleaf goldenbush redstem stork's bill California juniper desert needlegrass Sandberg bluegrass desert globemallow bristly fiddleneck Mexican bladdersage annual forbs shrubby deervetch Acton's brittlebush Indian ricegrass Mojave woodyaster Mojave yucca Nevada jointfir	14 12 7 6 5 5 4 3 2 2 1 1
3291: Smithcanyon - 40%	Sandy Xeric-Intergrade Slopes (R030XE196CA)	red brome singleleaf pinyon Muller oak blackbrush bigberry manzanita narrowleaf goldenbush Parry's beargrass bristly fiddleneck desert globemallow other annual forbs California juniper desert needlegrass Eastern Mojave buckwheat Mojave yucca threadleaf snakeweed	11 10 8 4 3 3 2 1 1 1
Stubbespring - 25%	Sandy Xeric-Intergrade Slopes (R030XE196CA)	Muller oak narrowleaf goldenbush desert needlegrass red brome Eastern Mojave buckwheat Parry's beargrass blackbrush California juniper singleleaf pinyon Mojave yucca shrubby deervetch	14 6 5 4 3 3 2 2 2 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3292:			
Smithcanyon - 35%	Sandy Xeric-Intergrade Slopes (R030XE196CA)	red brome	11
		singleleaf pinyon	10
		Muller oak	8
		blackbrush	4
		bigberry manzanita	3
		narrowleaf goldenbush	3
		Parry's beargrass	2
		bristly fiddleneck	1
		desert globemallow	1
		other annual forbs	1
		California juniper	
		desert needlegrass	
		Eastern Mojave buckwheat	
		Mojave yucca	
		threadleaf snakeweed	
Pinecity - 25%----	Shallow Cool Hills (R030XB189CA)	red brome	14
		blackbrush	12
		narrowleaf goldenbush	7
		redstem stork's bill	6
		California juniper	5
		desert needlegrass	5
		Sandberg bluegrass	4
		desert globemallow	3
		bristly fiddleneck	2
		Mexican bladdersage	2
		annual forbs	1
		shrubby deervetch	1
		Acton's brittlebush	
		Indian ricegrass	
		Mojave woodyaster	
		Mojave yucca	
		Nevada jointfir	
3293:			
Smithcanyon - 50%	Sandy Xeric-Intergrade Slopes (R030XE196CA)	Muller oak	12
		singleleaf pinyon	9
		bigberry manzanita	7
		California juniper	1
		desert needlegrass	1
		beavertail pricklypear	
		Eastern Mojave buckwheat	
		Joshua tree	
		narrowleaf goldenbush	
		red brome	
Pinecity - 25%----	Shallow Cool Hills (R030XB189CA)	red brome	14
		blackbrush	12
		narrowleaf goldenbush	7
		redstem stork's bill	6
		California juniper	5
		desert needlegrass	5
		Sandberg bluegrass	4
		desert globemallow	3
		bristly fiddleneck	2
		Mexican bladdersage	2
		annual forbs	1
		shrubby deervetch	1
		Acton's brittlebush	
		Indian ricegrass	
		Mojave woodyaster	
		Mojave yucca	
		Nevada jointfir	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
3294: Smithcanyon, dry - 80%-----	Dry Sandy Mountain Slopes (R030XE191CA)	Muller oak  narrowleaf goldenbush  Sandberg bluegrass  singleleaf pinyon  cheatgrass  desert needlegrass  Indian ricegrass  red brome  beavertail pricklypear  cryptantha  Eastern Mojave buckwheat  green rabbitbrush  Joshua tree  lupine  Phacelia  pincushion flower  plains pricklypear	20 7 3 3 1 1 1 1 1
3295: Desertqueen, dry - 40%-----	Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)	Parish's goldeneye  Nevada jointfir  white bursage  water jacket  redstem stork's bill  big galleta  chia  creosote bush  desert globemallow  annual forbs  annual forbs  jojoba  white ratany  wishbone-bush  Eastern Mojave buckwheat  Mexican bladdersage  Mojave woodyaster  other annual forbs  red brome	7 6 5 4 3 2 1 1 1 1 1 1 1 1 1



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3295: Hexie - 20%-----	Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)	red brome big galleta white bursage jojoba Parish's goldeneye curvenut combseed Mojave yucca redstem stork's bill water jacket white ratany creosote bush desert globemallow Nevada jointfir beavertail pricklypear branched pencil cholla brownplume wirelettuce burrobrush cryptantha cushion foxtail cactus Eastern Mojave buckwheat annual forbs Mediterranean grass narrowleaf bedstraw New Mexico Plumeseed other shrubs spineflower turpentinebroom wishbone-bush	36 10 5 3 3 2 2 2 2 1 1 1                      
3296: Desertqueen - 45%	Shallow Cool Hills (R030XB189CA)	blackbrush Parish's goldeneye California juniper redstem stork's bill water jacket desert needlegrass Eastern Mojave buckwheat Mojave yucca Nevada jointfir Parry's beargrass big galleta desert globemallow green rabbitbrush Mexican bladdersage red brome threadleaf snakeweed	10 6 5 5 3 2 2 2 2 2 1 1 1 1 1  
Pinecity - 35%----	Shallow Cool Hills (R030XB189CA)	blackbrush red brome Nevada jointfir redstem stork's bill California juniper cheatgrass cryptantha Mojave yucca Engelmann's hedgehog cactus Joshua tree other annual forbs Parry's beargrass water jacket Acton's brittlebush	33 10 5 5 3 2 2 2 1 1 1 1 1  

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3297: Desertqueen, warm - 40%-----	Limy Hill 5-7" p.z. (R030XB140CA)	white bursage  creosote bush  desert globemallow  sowthistle desertdandelion  big galleta  desertsenna  Mojave yucca  redstem stork's bill  white ratany  branched pencil cholla  buckwheat  Engelmann's hedgehog cactus  jojoba  lupine  Nevada jointfir  sweetbush	19 5 2 2 1 1 1 1 1        
Contactmine, dry - 20%-----	Limy Hill 5-7" p.z. (R030XB140CA)	white bursage  creosote bush  redstem stork's bill  white ratany  desert globemallow  desert Indianwheat  jojoba  Mojave yucca  big galleta  bristly fiddleneck  curvenut combseed  desertsenna  Nevada jointfir  smooth desertdandelion  sweetbush  brittle spineflower	13 8 3 3 2 2 2 2 1 1 1 1 1 1 1  
Seanna, dry - 20%	Limy Hill 3-5" P.Z. (R030XB139CA)	redstem stork's bill  creosote bush  desert trumpet  desert Indianwheat  white bursage  white ratany  bristly fiddleneck  chia  desert globemallow  sowthistle desertdandelion  beavertail pricklypear  Engelmann's hedgehog cactus	13 12 8 5 3 3 1 1 1 1 1  

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
3325: Ironped, warm - 30%-----	Thermic Steep South Slopes (R030XB164CA)	brittlebush creosote bush brittle spineflower lacy phacelia whisperingbells desert globemallow desert poppy desert trumpet redstem stork's bill sand fringe pod water jacket white bursage annual forbs jojoba	14 10 5 3 2 1 1 1 1 1 1 1 1
Hexie - 15%-----	Very Shallow To Moderately Deep Gravelly Slopes (R030XB193CA)	red brome white bursage desert calico Parish's goldeneye big galleta bristly fiddleneck desert globemallow Nevada jointfir water jacket combseed other annual forbs wishbone-bush Eastern Mojave buckwheat jojoba rayless goldenhead bush muhly cryptantha desert needlegrass Engelmann's hedgehog cactus Mojave woodyaster narrowleaf bedstraw spiny hopsage	15 8 7 5 4 3 3 3 3 3 2 2 1 1 1 1 1 1 1 1 1 1 1
Ironped - 15%-----	Warm Gravelly Shallow Hills (R030XB172CA)	Parish's goldeneye creosote bush bristly fiddleneck Nevada jointfir red brome white bursage catclaw acacia chia cryptantha desert trumpet Eastern Mojave buckwheat jojoba Mojave yucca redstem stork's bill water jacket wishbone-bush big galleta desert globemallow desert needlegrass littleleaf ratany white ratany	10 7 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
3335: Xeric Torriorthents - 40%-----	Sandy Xeric-Intergrade Slopes (R030XE196CA)	red brome singleleaf pinyon Muller oak blackbrush bigberry manzanita narrowleaf goldenbush Parry's beargrass bristly fiddleneck desert globemallow other annual forbs California juniper desert needlegrass Eastern Mojave buckwheat Mojave yucca threadleaf snakeweed	11 10 8 4 3 3 2 1 1 1
Xeric Torriorthents - warm, 25%-----	Dry Sandy Mountain Slopes (R030XE191CA)	Muller oak narrowleaf goldenbush Sandberg bluegrass singleleaf pinyon cheatgrass desert needlegrass Indian ricegrass red brome beavertail pricklypear cryptantha Eastern Mojave buckwheat green rabbitbrush Joshua tree lupine Phacelia pincushion flower plains pricklypear	20 7 3 3 1 1 1 1
3336: Xeric Torriorthents - 45%-----	Sandy Xeric-Intergrade Slopes (R030XE196CA)	cheatgrass Muller oak singleleaf pinyon California juniper desert bitterbrush chia Eastern Mojave buckwheat granite prickly phlox spineflower wishbone-bush desert needlegrass	10 4 4 3 3 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3336: Bigbernie - 25%---	Moderately Deep Gravelly Mountain Slopes (R030XB213CA)	California juniper wishbone-bush annual grasses annual forbs red brome Parish's goldeneye bastardsage big galleta blackbrush desert needlegrass Eastern Mojave buckwheat green rabbitbrush Mojave sage Mojave woodyaster Mojave yucca Parry's beargrass	7 6 5 5 5 4 3 2 1 1 1 1 1 1 1 1
3340: Seanna - 35%-----	Limy Hill 5-7" p.z. (R030XB140CA)	white bursage creosote bush redstem stork's bill white ratany desert globemallow desert Indianwheat jojoba Mojave yucca big galleta bristly fiddleneck curvenut combseed desertsenna Nevada jointfir smooth desertdandelion sweetbush brittle spineflower	13 8 3 3 2 2 2 2 1 1 1 1 1 1 1 1
Grubstake, moist - 20%-----	Limy Hill 5-7" p.z. (R030XB140CA)	creosote bush redstem stork's bill white bursage white ratany Nevada jointfir big galleta bristly fiddleneck Parish's goldeneye sweetbush brownplume wirelettuce sowthistle desertdandelion	10 5 4 4 2 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
3340: Pinecity - 15%----	Shallow Cool Hills (R030XB189CA)	red brome blackbrush narrowleaf goldenbush redstem stork's bill California juniper desert needlegrass Sandberg bluegrass desert globemallow bristly fiddleneck Mexican bladdersage annual forbs shrubby deervetch Acton's brittlebush Indian ricegrass Mojave woodyaster Mojave yucca Nevada jointfir	14 12 7 6 5 5 4 3 2 2 1 1
3345: Bigcanyon - 55%---	Warm Gravelly Shallow Hills (R030XB172CA)	burrobrush chia creosote bush sowthistle desertdandelion catclaw acacia common Mediterranean grass Parish's goldeneye queen's-root dalea Mojave yucca Parry's jujube pygmy poppy cryptantha Eastern Mojave buckwheat annual forbs Nevada jointfir redstem stork's bill wishbone-bush	7 7 7 7 4 3 3 2 1 1 1 1 1 1 1 1 1 1
Bigcanyon, cool - 20%-----	Moderately Deep Gravelly Mountain Slopes (R030XB213CA)	California juniper Sandberg bluegrass sowthistle desertdandelion chia buckwheat Virgin River brittlebush bristly fiddleneck desert globemallow Eastern Mojave buckwheat burrobrush annual forbs monkeyflower Nevada jointfir Parry's jujube beavertail pricklypear cryptantha	11 7 6 5 3 3 2 2 2 1 1 1 1 1 1 1



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
3440: Pacific Mesa, steep - 65%-----	Limy Hill 5-7" p.z. (R030XB140CA)	creosote bush white bursage redstem stork's bill desert globemallow smooth desertdandelion water jacket white ratany bristly fiddleneck cottontop cactus Engelmann's hedgehog cactus Eschscholzia poppy annual forbs jojoba Nevada jointfir Parish's goldeneye red brome	6 5 4 2 2 2 2 1 1 1 1 1 1 1 1
Pacific Mesa - 30%	Limy 5-7" p.z. (Low Production) (R030XB156CA)	creosote bush desert Indianwheat redstem stork's bill white bursage Mojave yucca red brome Nevada jointfir desert globemallow jojoba sowthistle desertdandelion water jacket beavertail pricklypear birdcage evening primrose buckwheat Engelmann's hedgehog cactus white ratany	5 4 4 4 3 3 2 1 1 1 1 1 1 1 1
3509: Cajon, very rarely flooded - 60%-----	Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)	white bursage chia creosote bush Hall's shrubby-spurge brittle spineflower pincushion flower bristly fiddleneck buckwheat daisy desertstar annual forbs Mojave yucca redstem stork's bill sixweeks threeawn white ratany branched pencil cholla jojoba smooth desertdandelion Wiggin's cholla	6 5 4 4 2 2 1 1 1 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3509: Friedliver - 20%--	Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)	creosote bush redstem stork's bill bristly fiddleneck buckwheat Hall's shrubby-spurge brownplume wirelettuce big galleta lupine red brome white bursage white ratany chia	9 6 3 3 3 2 1 1 1 1 1 1
3525: Cajon - 70%-----	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush smooth desertdandelion cryptantha white bursage brownplume wirelettuce whitemargin sandmat Asian Mustard bristly fiddleneck Mediterranean grass buckwheat chia sowthistle desertdandelion Wiggin's cholla	11 10 5 5 2 2 1 1 1 1 1 1 1
Friedliver - 15%--	LIMY 5-7 P.Z. (R030XB005NV)	white bursage creosote bush curvenut combseed sowthistle desertdandelion white ratany chia desertsenna annual forbs Mojave yucca redstem stork's bill birdcage evening primrose branched pencil cholla bristly fiddleneck Mediterranean grass New Mexico Plumeseed redroot cryptantha smooth desertdandelion spineflower suncup wolly easterbonnets	10 6 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
3526: Cajon - 40%-----	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush smooth desertdandelion Mojave yucca big galleta red brome white bursage bristly fiddleneck desert globemallow Mediterranean grass redstem stork's bill wollystar chia	13 5 4 2 2 2 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3526: Hypoint - 35%----	Gravelly Outwash (R030XY159CA)	creosote bush white bursage desertsenna white ratany bristly fiddleneck chia annual forbs Mediterranean grass redstem stork's bill smooth desertdandelion manybristle cinchweed Mexican bladdersage wollystar	20 5 3 2 1 1 1 1 1 1 1
Arizo, occasionally flooded - 15%----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	burrobrush smooth desertdandelion buckwheat creosote bush cryptantha Schott's dalea catclaw acacia distant phacelia bladderpod spiderflower bristly fiddleneck chia curvenut combseed annual forbs hairy milkweed pincushion flower sweetbush redstem stork's bill small wirelettuce Wiggin's cholla	8 8 3 3 3 3 2 2 1 1 1 1 1 1 1 1 1 1
3611: Burntshack, sand surface - 50%----	Sandy Fan Aprons (R030XB174CA)	big galleta creosote bush white bursage bristly fiddleneck burrobrush Joshua tree Mexican bladdersage Mojave yucca Nevada jointfir pincushion flower red brome redstem stork's bill smooth desertdandelion white ratany Great Basin langloisia Wiggin's cholla	14 3 3 2 1 1 1 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3611: Burntshack - 35%--	Sandy Fan Aprons (R030XB174CA)	big galleta	14
		creosote bush	3
		white bursage	3
		bristly fiddleneck	2
		burrobrush	1
		Joshua tree	1
		Mexican bladdersage	1
		Mojave yucca	1
		Nevada jointfir	1
		pincushion flower	1
		red brome	1
		redstem stork's bill	1
		smooth desertdandelion	1
		white ratany	1
		Great Basin langloisia	
		Wiggin's cholla	
3612: Burntshack - 75%--	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush	9
		white bursage	4
		desert trumpet	2
		Mojave yucca	2
		big galleta	1
		Nevada jointfir	1
		red brome	1
		redstem stork's bill	1
		desert globemallow	
Burntshack, occasionally flooded - 20%----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	burrobrush	8
		smooth desertdandelion	8
		buckwheat	3
		creosote bush	3
		cryptantha	3
		Schott's dalea	3
		catclaw acacia	2
		distant phacelia	2
		bladderpod spiderflower	1
		bristly fiddleneck	1
		chia	1
		curvenut combseed	1
		annual forbs	1
		hairy milkweed	1
		pincushion flower	1
		sweetbush	1
		redstem stork's bill	
		small wirelettuce	
		Wiggin's cholla	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
3676: Morongo, loamy sand, very rarely flooded - 80%----	Sandy Fan Aprons (R030XB174CA)	big galleta  creosote bush  white bursage  bristly fiddleneck  burrobrush  Joshua tree  Mexican bladdersage  Mojave yucca  Nevada jointfir  pincushion flower  red brome  redstem stork's bill  smooth desertdandelion  white ratany  Great Basin langloisia  Wiggin's cholla	14 3 3 2 1 1 1 1 1 1 1 1 1 1
3677: Morongo - 80%----	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush  bristly fiddleneck  pincushion flower  brittle spineflower  desert calico  annual forbs  Joshua tree  Mojave yucca  big galleta  curvenut combseed  Mediterranean grass  redstem stork's bill  white bursage  white ratany  red brome  Wiggin's cholla  wishbone-bush	6 5 3 2 2 2 2 2 1 1 1 1 1 1 1
3679: Morongo, cool - 55%-----	Cool Deep Sandy Fans (R030XB168CA)	blackbrush  cheatgrass  California juniper  big galleta  golden linanthus  Joshua tree  Nevada jointfir  Wiggin's cholla	25 9 3 1 1 1 1
Jumborox - 20%----	Cool Deep Sandy Fans (R030XB168CA)	blackbrush  red brome  Eastern Mojave buckwheat  pincushion flower  Muller oak  Nevada jointfir  California juniper  bristly fiddleneck  desert needlegrass  narrowleaf goldenbush  desert bitterbrush  threadleaf snakeweed  Wiggin's cholla	22 8 5 5 4 4 3 2 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3680: Morongo - 85%-----	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush white bursage Nevada jointfir desertsenna branched pencil cholla Mexican bladdersage Mojave yucca white ratany	12 5 2 1
3681: Morongo, very rarely flooded - 45%-----	Sandy Fan Aprons (R030XB174CA)	big galleta creosote bush white bursage bristly fiddleneck burrobrush Joshua tree Mexican bladdersage Mojave yucca Nevada jointfir pincushion flower red brome redstem stork's bill smooth desertdandelion white ratany Great Basin langloisia Wiggin's cholla	14 3 3 2 1 1 1 1 1 1 1 1 1 1
Jumborox, dry - 35%-----	Coarse Loamy Very Deep Fan Remnants (R030XB173CA)	big galleta creosote bush red brome California jointfir Cooper's goldenbush Mexican bladdersage redstem stork's bill bristly fiddleneck burrobrush white ratany desert needlegrass annual forbs Joshua tree Mojave yucca turpentinebroom wishbone-bush California juniper Eastern Mojave buckwheat Phacelia Wiggin's cholla	11 6 5 4 3 3 3 2 2 2 1 1 1 1 1 1 1 1 1
3682: Morongo, cool - 50%-----	Cool Deep Sandy Fans (R030XB168CA)	blackbrush cheatgrass California juniper big galleta golden linanthus Joshua tree Nevada jointfir Wiggin's cholla	25 9 3 1 1 1 1



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
3682: Jumborox - 15%----	Cool Deep Sandy Fans (R030XB168CA)	blackbrush red brome Eastern Mojave buckwheat pincushion flower Muller oak Nevada jointfir California juniper bristly fiddleneck desert needlegrass narrowleaf goldenbush desert bitterbrush threadleaf snakeweed Wiggin's cholla	22 8 5 5 4 4 3 2 1 1
3683: Morongo - 55%-----	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush curvenut combseed pincushion flower branched pencil cholla Mojave yucca white bursage Mediterranean grass smooth desertdandelion desertsenna redstem stork's bill white ratany	10 4 3 2 2 2 1 1
Bluecut, very rarely flooded - 30%-----	Very Rarely Flooded, Warm Thermic Fan Piedmonts (R030XB192CA)	creosote bush brownplume wirelettuce pincushion flower desert Indianwheat white bursage branched pencil cholla big galleta buckwheat curvenut combseed desertsenna jojoba Mojave desertstar Mojave yucca Parry's false pararie-flower redstem stork's bill spiny menodora desert trumpet littleleaf ratany Wiggin's cholla	14 4 4 3 3 2 1 1 1 1 1 1 1 1 1 1 1
3684: Morongo, warm - 85%-----	Very Rarely Flooded, Warm Thermic Fan Piedmonts (R030XB192CA)	big galleta creosote bush desertsenna Mojave yucca bristly fiddleneck burrobrush Nevada jointfir Eastern Mojave buckwheat jojoba Mexican bladdersage Mojave indigobush redstem stork's bill	7 5 3 3 2 2 2 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
3685: Morongo, cool - 65%-----	Cool Deep Sandy Fans (R030XB168CA)	cheatgrass blackbrush Mexican bladdergrass California juniper Eastern Mojave buckwheat Nevada jointfir big galleta gilgia Joshua tree narrowleaf goldenbush red brome Sandberg bluegrass desert bitterbrush desert needlegrass water jacket wishbone-bush	9 5 4 3 2 2 1 1 1 1 1 1 1 1 1 1
Desertqueen, undulating - 15%	Dissected Pediment, Cool (R030XB166CA)	blackbrush red brome California juniper narrowleaf goldenbush curvenut combseed Joshua tree Mojave yucca rubber rabbitbrush Sandberg bluegrass larkspur trefoil wishbone-bush	17 7 3 3 1 1 1 1 1 1 1 1 1
3690: Nasagold - 85%----	Coarse Loamy Very Deep Fan Remnants (R030XB173CA)	redstem stork's bill bristly fiddleneck water jacket Nevada jointfir big galleta peach thorn creosote bush Joshua tree red brome Wiggin's cholla buckwheat goldenbush	17 10 7 4 3 3 2 2 2 2 2 1 1
3695: Gocougs - 80%-----	Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)	white bursage creosote bush chia cryptantha Hall's shrubby-spurge big galleta bristly fiddleneck jojoba Mojave yucca pincushion flower red brome redstem stork's bill branched pencil cholla grape soda lupine	8 7 4 4 3 2 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4031:			
Crosgrain - 50%---	Limy 5-7" p.z. (Low Production) (R030XB156CA)		
Crackerjack - 30%	Limy Hill 3-5" P.Z. (R030XB139CA)	creosote bush	20
		redstem stork's bill	7
		curvenut combseed	3
		littleleaf ratany	3
		Mojave yucca	3
		white bursage	3
		white ratany	2
		cryptantha	1
		jojoba	1
		smooth desertdandelion	1
		branched pencil cholla	
		bristly fiddleneck	
		desert globemallow	
		Mediterranean grass	
		red brome	
		wollystar	
Pinkcan, dry - 15%	Limy 5-7" p.z. (Low Production) (R030XB156CA)	creosote bush	11
		redstem stork's bill	10
		pincushion flower	6
		curvenut combseed	5
		littleleaf ratany	4
		annual forbs	3
		Mojave yucca	3
		white bursage	3
		bristly fiddleneck	2
		common Mediterranean grass	1
		desert globemallow	1
		desert trumpet	1
		Nevada jointfir	1
		red brome	1
		white ratany	1
		whitemargin sandmat	1
4041:			
Silvermine - 40%--	Limy Hill 5-7" p.z. (R030XB140CA)	white bursage	10
		creosote bush	7
		sowthistle desertdandelion	5
		bristly fiddleneck	2
		desert Indianwheat	2
		Mojave indigobush	2
		Mojave yucca	2
		white ratany	2
		desert pepperweed	1
		desertsenna	1
		Nevada jointfir	1
		sweetbush	1
		catclaw acacia	
		desert globemallow	
		Mexican bladdersage	

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4041: Helendale - 30%---	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush white bursage desert trumpet Mojave yucca big galleta Nevada jointfir red brome redstem stork's bill desert globemallow	9 4 2 2 1 1 1 1 1
Burntshack, very rarely flooded - 20%-----	Sandy Plain 3-5" P.Z. (R030XB148CA)	big galleta creosote bush other annual forbs Indian ricegrass other perennial grasses other shrubs	8 2 2 1 1 1
4064: Gravesumit - 55%---	Granitic Loam (R030XB137CA)	littleleaf ratany creosote bush redstem stork's bill buckwheat big galleta wollystar bristly fiddleneck lupine Mexican bladdersage other annual forbs white ratany catclaw acacia Hall's shrubby-spurge red brome	8 7 6 4 2 2 1 1 1 1 1 1 1
Helendale, sandy surface - 35%---	Granitic Loam (R030XB137CA)	littleleaf ratany creosote bush redstem stork's bill buckwheat big galleta wollystar bristly fiddleneck lupine Mexican bladdersage other annual forbs white ratany catclaw acacia Hall's shrubby-spurge red brome	8 7 6 4 2 2 1 1 1 1 1 1 1
4071: Helendale - 65%---	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush white bursage desert trumpet Mojave yucca big galleta Nevada jointfir red brome redstem stork's bill desert globemallow	9 4 2 2 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4071: Desertqueen, very rarely flooded - 15%-----	Cool Shallow Fans Over Pediment (R030XB188CA)	blackbrush  creosote bush  redstem stork's bill  bristly fiddleneck  Mojave yucca  cryptantha  Eastern Mojave buckwheat  water jacket  burrobrush  littleleaf ratany  turpentinebroom  white ratany  desertsenna  Great Basin langloisia  pincushion flower	11 5 5 3 3 2 2 2 1 1 1 1 1 1 1
4091: Littlefargo - 85%	Cool Deep Sandy Fans (R030XB168CA)	blackbrush  red brome  Eastern Mojave buckwheat  pincushion flower  Muller oak  Nevada jointfir  California juniper  bristly fiddleneck  desert needlegrass  narrowleaf goldenbush  desert bitterbrush  threadleaf snakeweed  Wiggin's cholla	22 8 5 5 4 4 3 2 1 1 1 1 1
4245: Bluecut - 40%-----	Loamy Very Deep Fan Remnants (R030XB183CA)	blackbrush  pincushion flower  smooth desertdandelion  big galleta  white bursage  creosote bush  Eastern Mojave buckwheat  Nevada jointfir  redstem stork's bill  burrobrush  Joshua tree  Mojave yucca  white ratany  bristly fiddleneck  jojoba  red brome	11 10 7 5 4 2 2 2 2 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4245: Morongo, very rarely flooded - 25%-----	Sandy Fan Aprons (R030XB174CA)	big galleta   creosote bush   white bursage   bristly fiddleneck   burrobrush   Joshua tree   Mexican bladdersage   Mojave yucca   Nevada jointfir   pincushion flower   red brome   redstem stork's bill   smooth desertdandelion   white ratany   Great Basin langloisia   Wiggin's cholla	14 3 3 2 1 1 1 1 1 1 1 1 1
Yander, very rarely flooded - 15%-----	Sandy Fan Aprons (R030XB174CA)	big galleta   creosote bush   white bursage   bristly fiddleneck   burrobrush   Joshua tree   Mexican bladdersage   Mojave yucca   Nevada jointfir   pincushion flower   red brome   redstem stork's bill   smooth desertdandelion   white ratany   Great Basin langloisia   Wiggin's cholla	14 3 3 2 1 1 1 1 1 1 1 1 1
4260: Minhoyt - 45%-----	Very Shallow Duripan Fan Remnants (R030XB220CA)	Hall's shrubby-spurge   Nevada jointfir   white bursage   blackbrush   jojoba   lotebush   water jacket   Asian Mustard   creosote bush   curvenut combseed   desert polygala   Mojave yucca   white ratany   cryptantha   desert globemallow   desert princesplume   lacy phacelia   pincushion flower   red brome   sowthistle desertdandelion	5 3 3 2 2 2 2 1 1 1 1 1 1 1 1 1 1



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4260: Corbilt, rarely flooded - 40%----	Moderately Deep To Very Deep Loamy Fan Remnants (R030XB218CA)	creosote bush white bursage redstem stork's bill Hall's shrubby-spurge branched pencil cholla buckwheat chia jojoba Mojave yucca pincushion flower wishbone-bush desertsenna water jacket white ratany Wiggin's cholla	12 5 3 2 1 1 1 1 1 1 1
4265: Werewolf, warm - 80%-----	LIMY 3-5 P.Z. (R030XB019NV)	curvenut combseed creosote bush branched pencil cholla white bursage white ratany	23 10 2 1 1
4270: Yuccabutte, extremely cobbly sandy loam - 95%	Limy Hill 5-7" p.z. (R030XB140CA)	white bursage jojoba creosote bush Cooper's goldenbush annual forbs Nevada jointfir red brome white ratany desertsenna Mojave yucca smooth desertdandelion	22 5 2 1 1 1 1 1 1
4271: Yuccabutte, warm - 60%-----	Limy 5-7" p.z. (Low Production) (R030XB156CA)	white bursage cryptantha redstem stork's bill creosote bush desertsenna Mojave yucca smooth desertdandelion white ratany branched pencil cholla Wiggin's cholla	9 7 5 3 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4271: Arizo, rarely flooded - 30%----	Gravelly Outwash (R030XY159CA)	creosote bush   other annual forbs   chia   cryptantha   dalea   desertsenna   smooth desertdandelion   white ratany   burrobrush   cottontop cactus   jojoba   Phacelia   Mojave yucca	   12   3   2   2   2   2   2   2   1   1   1   1
4275: Pinkcan - 35%----	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush   white bursage   redstem stork's bill   big galleta   desertsenna   peach thorn   white ratany   chia   Eastern Mojave buckwheat   lotebush   lupine	   6   6   2   1   1   1   1   1     
Werewolf - 25%----	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush   pincushion flower   white bursage   redstem stork's bill   bristly fiddleneck   desertsenna   annual grasses   brittle spineflower   Mediterranean grass   Mojave yucca   white ratany	8   7   4   3   2   2   1   1   1   1 
Gocougs, warm - 15%-----	LIMY 5-7 P.Z. (R030XB005NV)	white bursage   creosote bush   annual forbs   redstem stork's bill   Mojave yucca   sowthistle desertdandelion   white ratany   bristly fiddleneck   desert globemallow	6   5   2   2   1   1   1 

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
4280: Mekkadale - 55%---	Limy Hill 3-5" P.Z. (R030XB139CA)	creosote bush white bursage desert globemallow jojoba red brome redstem stork's bill white ratany bristly fiddleneck chia annual forbs Mojave yucca wishbone-bush Nevada jointfir	10 3 2 2 2 2 2 1 1 1 1 1 1
Edalph, warm - 25%	Limy Hill 3-5" P.Z. (R030XB139CA)	creosote bush white bursage desert globemallow jojoba red brome redstem stork's bill white ratany bristly fiddleneck chia annual forbs Mojave yucca wishbone-bush Nevada jointfir	10 3 2 2 2 2 2 1 1 1 1 1 1
4285: Typic Argidurids - 35%	Limy Hill 5-7" p.z. (R030XB140CA)	white bursage creosote bush redstem stork's bill white ratany desert globemallow desert Indianwheat jojoba Mojave yucca big galleta bristly fiddleneck curvenut combseed desertsenna Nevada jointfir smooth desertdandelion sweetbush brittle spineflower	13 8 3 3 2 2 2 2 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
4285: Coppermine - 30%--	Limy Hill 3-5" P.Z. (R030XB139CA)	desert Indianwheat creosote bush smooth desertdandelion Mediterranean grass Parry's false pararie-flower redstem stork's bill spineflower white bursage buckwheat desert trumpet Engelmann's hedgehog cactus annual forbs Mojave yucca pygmy poppy white ratany California fagonbush desertsenna jojoba suncup sweetbush	10 6 3 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1
Minhoyt, warm - 25%-----	Limy Hill 5-7" p.z. (R030XB140CA)	creosote bush white bursage desert Indianwheat white ratany smooth desertdandelion desert globemallow Mojave yucca redstem stork's bill curvenut combseed desert trumpet jojoba low woollygrass cushion foxtail cactus desertsenna annual forbs Mediterranean grass Parry's false pararie-flower woody crinklemat	9 8 6 4 3 2 2 2 1 1 1 1 1 1 1 1 1 1 1
4403: Arizo, rarely flooded, channeled - 50%--	Flooded Gravelly Fans (R030XY038CA)	creosote bush curvenut combseed desertsenna smooth desertdandelion Schott's dalea Mediterranean grass Mojave yucca white ratany bristly fiddleneck desert globemallow Parish's goldeneye	13 6 6 5 4 2 2 2 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
4403: Arizo, rarely flooded - 25%----	Mid Size Thermic To Hyperthermic Ephemeral Stream (R030XY186CA)	burrobrush  sweetbush  Schott's dalea  creosote bush  smooth desertdandelion  bristly fiddleneck  brownplume wirelettuce  catclaw acacia  chia  curvenut combseed  distant phacelia  jojoba  Mediterranean grass  Mexican bladdersage  Mojave indigobush  Mojave yucca  Parish's goldeneye  peach thorn  pincushion  pincushion flower  red brome  redstem stork's bill  Thurber's sandpaper plant  white ratany  annual forbs	12 5 4 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Arizo - 20%-----	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush  curvenut combseed  Mojave yucca  white bursage  lupine  sweetbush  bristly fiddleneck  littleleaf ratany  Mediterranean grass  peach thorn  red brome  smooth desertdandelion  branched pencil cholla  desert globemallow  redstem stork's bill  Wiggin's cholla	17 16 5 3 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1
4440: Dragonwash, occasionally flooded - 55%----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	creosote bush  curvenut combseed  pincushion flower  Nevada jointfir  redstem stork's bill  common Mediterranean grass  combseed  Mojave yucca  Schott's dalea  western tansymustard  bristly fiddleneck  catclaw acacia  white ratany  wolly easterbonnets	11 6 5 4 4 3 1 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4440: Dragonwash, frequently flooded - 35%----	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream (R030XY010CA)	desert willow catclaw acacia smoketree burrobrush bladderpod spiderflower desert almond Mojave indigobush Mojave rabbitbrush American Threefold bristly fiddleneck brownplume wirelettuce chia red brome	8 5 5 2 1 1 1 1 1 1 1 1 1
4450: Morongo, occasionally flooded - 75%----	Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)	catclaw acacia common Mediterranean grass red brome peach thorn burrobrush Nevada jointfir cheatgrass Joshua tree redstem stork's bill bristly fiddleneck buckwheat California jointfir desert trumpet annual forbs Schott's dalea	11 6 5 4 3 3 2 2 2 1 1 1 1 1 1 1
Morongo, frequently flooded - 15%----	Large, Sandy, Thermic, Ephemeral Stream (R030XY167CA)	desert willow red brome brittlebush cheatgrass Mojave indigobush catclaw acacia common Mediterranean grass bristly fiddleneck burrobrush desert almond redstem stork's bill blazingstar cryptantha desertsenna woolly easterbonnets combseed evening-primrose sowthistle desertdandelion Wiggin's cholla	9 7 5 5 5 4 4 2 2 2 2 1 1 1 1 1 1 1 1 1



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

[illegible]

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

[illegible]

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
4610: Jumborox, warm - 25%-----	Loamy Very Deep Fan Remnants (R030XB183CA)	blackbrush  creosote bush  chuckwalla combseed  annual forbs  redstem stork's bill  burrobrush  Mojave yucca  bristly fiddleneck  common Mediterranean grass  desertsenna  Mexican bladdersage  Panamint crptantha  pincushion flower  shrubby deervetch  water jacket  whisperingbells  Eastern Mojave buckwheat  Great Basin langloisia  Nevada jointfir  white ratany	16 7 5 4 3 2 2 1 1 1 1 1 1 1 1
4615: Desertqueen, cool - 45%-----	Dissected Pediment, Cool (R030XB166CA)	blackbrush  red brome  California juniper  narrowleaf goldenbush  curvenut combseed  Joshua tree  Mojave yucca  rubber rabbitbrush  Sandberg bluegrass  larkspur  trefoil  wishbone-bush	17 7 3 3 1 1 1 1 1   
Jumborox - 25%----	Cool Deep Sandy Fans (R030XB168CA)	blackbrush  red brome  Eastern Mojave buckwheat  pincushion flower  Muller oak  Nevada jointfir  California juniper  bristly fiddleneck  desert needlegrass  narrowleaf goldenbush  desert bitterbrush  threadleaf snakeweed  Wiggin's cholla	22 8 5 5 4 4 3 2 1 1  

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4620: Stranger - 40%----	Warm Sloping Pediments (R030XB225CA)	Hall's shrubby-spurge mouse's eye littleleaf ratany redstem stork's bill white bursage Acton's brittlebush bastardsage California juniper annual forbs narrowleaf bedstraw Bigelow's nolina catclaw acacia Eastern Mojave buckwheat jojoba Mojave yucca Nevada jointfir Parish's goldeneye big galleta cushion foxtail cactus Engelmann's hedgehog cactus Wiggin's cholla	4 4 3 3 3 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1
Grubstake, moist - 20%-----	Limy Hill 5-7" p.z. (R030XB140CA)	desert needlegrass white bursage littleleaf ratany Mojave yucca creosote bush cryptantha annual forbs jojoba Nevada jointfir Parish's goldeneye redstem stork's bill branched pencil cholla brittlebush desert globemallow Engelmann's hedgehog cactus narrowleaf bedstraw whisperingbells Wiggin's cholla wishbone-bush	7 4 3 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4625: Grinder - 50%-----	Loamy Fan Remnants And Pediments (R030XB221CA)	Hall's shrubby-spurge white bursage California juniper cryptantha blackbrush branched pencil cholla Mojave yucca chia Eastern Mojave buckwheat Mojave woodyaster water jacket Wiggin's cholla	12 12 4 4 3 2 2 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4625: Grinder, cool - 20%-----	Warm Sloping Pediments (R030XB225CA)	Hall's shrubby-spurge white bursage brownplume wirelettuce Eastern Mojave buckwheat Engelmann's hedgehog cactus jojoba Mojave yucca Nevada jointfir Parish's goldeneye water jacket white ratany chia desertsenna littleleaf ratany Mojave woodyaster narrowleaf bedstraw Parry's beargrass rayless goldenhead redstem stork's bill shrubby deervetch sweetbush	8 7 2 2 1 1 1 1 1 1 1
Pinkcan, cool - 15%-----	Loamy Fan Remnants And Pediments (R030XB221CA)	Hall's shrubby-spurge white bursage California juniper cryptantha blackbrush branched pencil cholla Mojave yucca chia Eastern Mojave buckwheat Mojave woodyaster water jacket Wiggin's cholla	12 12 4 4 3 2 2 1 1  1
4630: Thunderclap - 50%	Xeric Very Deep Sandy Fan Aprons On Pediments (R030XE200CA)	annual forbs cheatgrass Great Basin langloisia small wirelettuce desert globemallow smooth desertdandelion blackbrush Mojave yucca Parry's wirelettuce red brome whitemargin sandmat desert needlegrass Indian ricegrass	16 5 3 3 2 2 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
4630:			
Smithcanyon - 30%	Sandy Xeric-Intergrade Slopes (R030XE196CA)	red brome  singleleaf pinyon  Muller oak  blackbrush  bigberry manzanita  narrowleaf goldenbush  Parry's beargrass  bristly fiddleneck  desert globemallow  other annual forbs  California juniper  desert needlegrass  Eastern Mojave buckwheat  Mojave yucca  threadleaf snakeweed	11 10 8 4 3 3 2 1 1 1     
4804:			
Ironped - 25%----	Warm Gravelly Shallow Hills (R030XB172CA)	Parish's goldeneye  creosote bush  wishbone-bush  big galleta  desert needlegrass  Nevada jointfir  bristly fiddleneck  jojoba  Mojave sage  Parry's wirelettuce  red brome  white ratany  Eastern Mojave buckwheat	15 7 3 2 2 2 1 1 1 1 1 1 1  
Pinecity - 20%----	Shallow Cool Hills (R030XB189CA)	red brome  blackbrush  narrowleaf goldenbush  redstem stork's bill  California juniper  desert needlegrass  Sandberg bluegrass  desert globemallow  bristly fiddleneck  Mexican bladdersage  annual forbs  shrubby deervetch  Acton's brittlebush  Indian ricegrass  Mojave woodyaster  Mojave yucca  Nevada jointfir	14 12 7 6 5 5 4 3 2 2 1 1     



# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			Pct
4805: Ironped, cool - 30%-----	Dissected Pediment (R030XB171CA)	blackbrush redstem stork's bill Mediterranean grass Nevada jointfir pincushion flower Eastern Mojave buckwheat white ratany Acton's brittlebush catclaw acacia annual forbs littleleaf ratany Parish's goldeneye smooth desertdandelion trefoil Mojave yucca	11 9 6 4 3 2 2 1 1 1 1 1 1 1
4811: Pioneertown - 10%	Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)	blackbrush Muller oak red brome Sandberg bluegrass California juniper combseed forb, perennial narrowleaf goldenbush Parry's beargrass singleleaf pinyon broom snakeweed desert needlegrass annual forbs forb, perennial narrowleaf bedstraw Eastern Mojave buckwheat Mexican bladdersage Mojave sage Mojave yucca	8 5 5 5 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1
4825: Grubstake - 20%---	Warm Shallow Pediments (R030XB228CA)	creosote bush white bursage sweetbush white ratany popcornflower smooth desertdandelion burrobrush chia Schott's dalea	12 5 3 2 1 1 1 1 1
Cajon, rarely flooded - 20%----	LIMY 5-7 P.Z. (R030XB005NV)	creosote bush smooth desertdandelion buckwheat Nevada jointfir white bursage bristly fiddleneck chia gilia Mojave yucca big galleta catclaw acacia Wiggin's cholla	23 5 2 2 2 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
4825: Stranger, warm - 15%-----	Warm Shallow Pediments (R030XB228CA)	creosote bush white bursage desertsenna smooth desertdandelion white ratany Acton's brittlebush buckwheat catclaw acacia desert trumpet lupine Mojave yucca Parish's goldeneye chia jojoba littleleaf ratany Schott's dalea	10 10 4 3 3 1 1 1 1 1 1 1 1 1 1 1 1
4830: Pinecity, cool - 10%-----	Bouldery Very Shallow To Shallow Gravelly Slopes (R030XB170CA)	blackbrush Muller oak red brome Sandberg bluegrass California juniper combseed forb, perennial narrowleaf goldenbush Parry's beargrass singleleaf pinyon broom snakeweed desert needlegrass annual forbs forb, perennial narrowleaf bedstraw Eastern Mojave buckwheat Mexican bladdersage Mojave sage Mojave yucca	8 5 5 5 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1
4900: Aguilareal - 15%--	Warm Gravelly Shallow Hills (R030XB172CA)	Parish's goldeneye creosote bush bristly fiddleneck Nevada jointfir red brome white bursage catclaw acacia chia cryptantha desert trumpet Eastern Mojave buckwheat jojoba Mojave yucca redstem stork's bill water jacket wishbone-bush big galleta desert globemallow desert needlegrass littleleaf ratany white ratany	10 7 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 6.—Canopy Cover—Continued

Map unit symbol, soil name, and local phase and percent of map unit	Ecological site	Characteristic vegetation	Canopy cover
			<u>Pct</u>
Lostpalms - 15%---	Warm Gravelly Shallow Hills (R030XB172CA)	Parish's goldeneye creosote bush bristly fiddleneck Nevada jointfir red brome white bursage catclaw acacia chia cryptantha desert trumpet Eastern Mojave buckwheat jojoba Mojave yucca redstem stork's bill water jacket wishbone-bush big galleta desert globemallow desert needlegrass littleleaf ratany white ratany	10 7 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

# Soil Survey of Joshua Tree National Park, California

Table 7.—Correlated Ecological Sites

Site ID	Ecological Site Name
R030XB005NV	LIMY 5-7 P.Z.
R030XB019NV	LIMY 3-5 P.Z.
R030XB137CA	Granitic Loam
R030XB139CA	Limy Hill 3-5" P.Z.
R030XB140CA	Limy Hill 5-7" p.z.
R030XB148CA	Sandy Plain 3-5" P.Z.
R030XB156CA	Limy 5-7" p.z. (Low Production)
R030XB164CA	Thermic Steep South Slopes
R030XB166CA	Dissected Pediment, Cool
R030XB168CA	Cool Deep Sandy Fans
R030XB170CA	Bouldery Very Shallow To Shallow Gravelly Slopes
R030XB171CA	Dissected Pediment
R030XB172CA	Warm Gravelly Shallow Hills
R030XB173CA	Coarse Loamy Very Deep Fan Remnants
R030XB174CA	Sandy Fan Aprons
R030XB183CA	Loamy Very Deep Fan Remnants
R030XB188CA	Cool Shallow Fans Over Pediment
R030XB189CA	Shallow Cool Hills
R030XB192CA	Very Rarely Flooded, Warm Thermic Fan Piedmonts
R030XB193CA	Very Shallow To Moderately Deep Gravelly Slopes
R030XB213CA	Moderately Deep Gravelly Mountain Slopes
R030XB218CA	Moderately Deep To Very Deep Loamy Fan Remnants
R030XB220CA	Very Shallow Duripan Fan Remnants
R030XB221CA	Loamy Fan Remnants And Pediments
R030XB225CA	Warm Sloping Pediments
R030XB228CA	Warm Shallow Pediments
R030XD001CA	Hyperthermic Dry Hills
R030XD003CA	Hyperthermic Steep South Slopes
R030XD004CA	Low-Production Hyperthermic Hills
R030XD006CA	Dry Deep Sandy Fan Aprons
R030XD008CA	Hyperthermic Sandhill
R030XD014CA	Hyperthermic Sandy Plains
R030XD015CA	Hyperthermic Fans
R030XD023CA	Hyperthermic Dissected Shallow Pediment
R030XD025CA	Hyperthermic Sandsheets
R030XD039CA	Coarse Gravelly Fans
R030XD040CA	Hyperthermic Steep North Slopes
R030XD041CA	Channeled Warm Alluvial Fans
R030XD042CA	Hyperthermic Shallow to Moderately Deep Fan Remnants
R030XD152CA	Hyperthermic Saline Hill
R030XE191CA	Dry Sandy Mountain Slopes
R030XE196CA	Sandy Xeric-Intergrade Slopes
R030XE200CA	Xeric Very Deep Sandy Fan Aprons On Pediments
R030XY001CA	Occasionally Flooded, Hyperthermic, Diffuse Ephemeral Stream
R030XY002CA	Desert Pavement
R030XY010CA	Frequently Flooded, Gravelly, Hyperthermic To Warm-Thermic Ephemeral Stream
R030XY021CA	Occasionally Flooded, Hyperthermic, Desert Pavement Ephemeral Stream
R030XY038CA	Flooded Gravelly Fans
R030XY128CA	Broad, Gravelly, Hyperthermic Ephemeral Stream
R030XY154CA	Dune 3-5" P.Z.
R030XY159CA	Gravelly Outwash
R030XY167CA	Large, Sandy, Thermic, Ephemeral Stream
R030XY186CA	Mid Size Thermic To Hyperthermic Ephemeral Stream
R030XY187CA	Rarely Flooded Warm Thermic Ephemeral System
R030XY188CA	Slightly Alkaline, Rarely To Occasionally Flooded Ephemeral Stream
R030XY202CA	Very Rarely To Rarely Flooded Thermic Ephemeral Stream
R031XY001CA	Limy Hill 4-6" p.z.
R031XY002CA	Desert Pavement 2-4" p.z.
R031XY003CA	Steep South Slope 2-4" p.z.
R031XY004CA	Limy Hill 2-4" p.z.
R031XY006CA	Limy 2-4" p.z.
R031XY009CA	Gravelly Fan Remnants And Fan Aprons
R031XY010CA	Valley Wash
R031XY019CA	Coarse Gravelly Wash

# Soil Survey of Joshua Tree National Park, California

Table 7.—Correlated Ecological Sites—Continued

Site ID	Ecological Site Name
R031XY021CA	Very Gravelly Wash
R031XY026CA	Large, High Intensity, Frequently Flooded Ephemeral Stream
R031XY029CA	Frequently Flooded, Confined Ephemeral Stream
R031XY030CA	Extremely Stony Fan Remnants
R031XY034CA	Gravelly, Braided, Ephemeral Stream
R031XY200CA	Rarely Flooded Fans
R031XY201CA	Cobbly Fan Remnants
R031XY202CA	Stony, Occasionally Flooded Ephemeral Stream

# Soil Survey of Joshua Tree National Park, California

Table 8.-Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Common Name

(Plants displayed occur within the National Soils Information System [NASIS]  
plant tables used for the soil survey area. The scientific and common  
names are referenced at the USDA PLANTS database: [plants.usda.gov](http://plants.usda.gov))

Local common name	Scientific name	Plant symbol
Abrams' sandmat	<i>Chamaesyce abramsiana</i>	CHAB2
Acton's brittlebush	<i>Encelia actonii</i>	ENAC
American Threefold	<i>Trixis californica</i>	TRCA8
annual grasses		2GA
Asian Mustard	<i>Brassica tournefortii</i>	BRTO
bastardsage	<i>Eriogonum wrightii</i>	ERWR
beavertail pricklypear	<i>Opuntia basilaris</i>	OPBA2
big galleta	<i>Pleuraphis rigida</i>	PLRI3
bigberry manzanita	<i>Arctostaphylos glauca</i>	ARGL4
Bigelow's nolina	<i>Nolina bigelovii</i>	NOBI
birdcage evening		
primrose	<i>Oenothera deltoides</i>	OEDE2
blackbrush	<i>Coleogyne ramosissima</i>	CORA
bladderpod spiderflower	<i>Cleome isomeris</i>	CLIS
blazingstar	<i>Mentzelia</i>	MENTZ
blue paloverde	<i>Parkinsonia florida</i>	PAFL6
branched pencil cholla	<i>Cylindropuntia ramosissima</i>	CYRA9
bristly fiddleneck	<i>Amsinckia tessellata</i>	AMTE3
brittle spineflower	<i>Chorizanthe brevicornu</i>	CHBR
brittlebush	<i>Encelia</i>	ENCEL
brittlebush	<i>Encelia farinosa</i>	ENFA
brome	<i>Bromus</i>	BROMU
broom snakeweed	<i>Gutierrezia sarothrae</i>	GUSA2
brownplume wirelettuce	<i>Stephanomeria pauciflora</i>	STPA4
buckwheat	<i>Eriogonum</i>	ERIOG
burrobrush	<i>Hymenoclea salsola</i>	HYSA
burrobush	<i>Ambrosia dumosa</i>	AMDU2
bush muhly	<i>Muhlenbergia porteri</i>	MUPO2
California barrel cactus	<i>Ferocactus cylindraceus</i>	FECY
California broomsage	<i>Lepidospartum squamatum</i>	LESQ
California buckwheat	<i>Eriogonum fasciculatum</i>	ERFA2
California croton	<i>Croton californicus</i>	CRCA5
California fagonbush	<i>Fagonia laevis</i>	FALA
California jointfir	<i>Ephedra californica</i>	EPCA2
California juniper	<i>Juniperus californica</i>	JUCA7
calthaleaf phacelia	<i>Phacelia calthifolia</i>	PHCA2
cane bluestem	<i>Bothriochloa barbinodis</i>	BOBA3
catclaw acacia	<i>Acacia greggii</i>	ACGR
cattle saltbush	<i>Atriplex polycarpa</i>	ATPO
cheatgrass	<i>Bromus tectorum</i>	BRTE
chia	<i>Salvia columbariae</i>	SACO6
chuckwalla combseed	<i>Pectocarya heterocarpa</i>	PEHE
combseed	<i>Pectocarya</i>	PECTO
common Mediterranean		
grass	<i>Schismus barbatus</i>	SCBA
compact brome	<i>Bromus madritensis</i>	BRMA3
Cooper's goldenbush	<i>Ericameria cooperi</i>	ERCO23
cottontop cactus	<i>Echinocactus polycephalus</i>	ECPO2
coyote gourd	<i>Cucurbita palmata</i>	CUPA
creosote bush	<i>Larrea tridentata</i>	LATR2
cryptantha	<i>Cryptantha</i>	CRYPT
curvenut combseed	<i>Pectocarya recurvata</i>	PERE
cushion foxtail cactus	<i>Escobaria alversonii</i>	ESAL2
cutleaf filaree	<i>Erodium cicutarium</i>	ERCI6
daisy desertstar	<i>Monoptilon bellidiforme</i>	MOBE
dalea	<i>Psoralea arguta</i>	PSORO
desert almond	<i>Prunus fasciculata</i>	PRFA
desert bitterbrush	<i>Purshia glandulosa</i>	PUGL2
desert calico	<i>Loeseliastrum matthewsii</i>	LOMA10



# Soil Survey of Joshua Tree National Park, California

Table 8.—Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Common Name—Continued

Local common name	Scientific name	Plant symbol
desert dodder	<i>Cuscuta denticulata</i>	CUDE2
desert globemallow	<i>Sphaeralcea ambigua</i>	SPAM2
desert Indianwheat	<i>Plantago ovata</i>	PLOV
desert ironwood	<i>Olneya tesota</i>	OLTE
desert lavender	<i>Hyptis emoryi</i>	HYEM
desert marigold	<i>Baileya multiradiata</i>	BAMU
desert needlegrass	<i>Achnatherum speciosum</i>	ACSP12
desert palafox	<i>Palafoxia arida</i>	PAAR8
desert pepperweed	<i>Lepidium fremontii</i>	LEFR2
desert polygala	<i>Polygala acanthoclada</i>	POAC2
desert poppy	<i>Eschscholzia glyptosperma</i>	ESGL
desert princesplume	<i>Stanleya pinnata</i>	STPI
desert thorn-apple	<i>Datura discolor</i>	DADI2
desert trumpet	<i>Eriogonum inflatum</i>	ERIN4
desert willow	<i>Chilopsis linearis</i>	CHLI2
desertholly	<i>Atriplex hymenelytra</i>	ATHY
desertsenna	<i>Senna armata</i>	SEAR8
devil's spineflower	<i>Chorizanthe rigida</i>	CHRI
distant phacelia	<i>Phacelia distans</i>	PHDI
dyebush	<i>Psoralea arguta</i>	PSEM
Eastern Mojave buckwheat	<i>Eriogonum fasciculatum</i>	ERFA2
Eastern Mojave buckwheat	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	ERFAP
Engelmann's hedgehog		
cactus	<i>Echinocereus engelmannii</i>	ECEN
Eschscholzia poppy	<i>Eschscholzia</i>	ESCHS
evening-primrose	<i>Oenothera</i>	OENOT
fiddleneck	<i>Amsinckia</i>	AMSIN
flatcrown buckwheat	<i>Eriogonum deflexum</i>	ERDE6
forb, annual		2FA
forb, perennial		2FP
four o'clock	<i>Mirabilis</i>	MIRAB
ghost flower	<i>Mohavea confertiflora</i>	MOCO
gilia	<i>Gilia</i>	GILIA
golden linanthus	<i>Leptosiphon aureus</i> ssp. <i>aureus</i>	LEAUA3
goldenbush	<i>Ericameria</i>	ERICA2
granite prickly phlox	<i>Linanthus pungens</i>	LIPU11
grape soda lupine	<i>Lupinus excubitus</i>	LUEX
grass, perennial		2GP
Great Basin langloisia	<i>Langloisia setosissima</i>	LASE3
green rabbitbrush	<i>Ericameria teretifolia</i>	ERTE18
hairy desertsunflower	<i>Geraea canescens</i>	GECA2
hairy milkweed	<i>Funastrum hirtellum</i>	FUHI
Hall's shrubby-spurge	<i>Tetracoccus hallii</i>	TEHA
honey mesquite	<i>Prosopis glandulosa</i>	PRGL2
Indian ricegrass	<i>Achnatherum hymenoides</i>	ACHY
jojoba	<i>Simmondsia chinensis</i>	SICH
Joshua tree	<i>Yucca brevifolia</i>	YUBR
lacy phacelia	<i>Phacelia tanacetifolia</i>	PHTA
larkspur	<i>Delphinium</i>	DELPH
littleleaf ratany	<i>Krameria erecta</i>	KRER
lotebush	<i>Ziziphus obtusifolia</i>	ZIOB
low woollygrass	<i>Dasyochloa pulchella</i>	DAPU7
lupine	<i>Lupinus</i>	LUPIN
manybristle cinchweed	<i>Pectis papposa</i>	PEPA2
Mediterranean grass	<i>Schismus</i>	SCHIS
Mexican bladdersage	<i>Salazaria mexicana</i>	SAME
milkweed	<i>Asclepias</i>	ASCLE
mistletoe	<i>Phoradendron</i>	PHORA
Mojave cottonthorn	<i>Tetradymia stenolepis</i>	TEST2
Mojave desertstar	<i>Monoptilon bellioides</i>	MOBE2
Mojave indigobush	<i>Psoralea arguta</i>	PSAR4
Mojave rabbitbrush	<i>Ericameria paniculata</i>	ERPA29
Mojave sage	<i>Salvia mohavensis</i>	SAMO3
Mojave seablite	<i>Suaeda moquinii</i>	SUMO

# Soil Survey of Joshua Tree National Park, California

Table 8.—Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Common Name—Continued

Local common name	Scientific name	Plant symbol
Mojave woodyaster	Xylorhiza tortifolia	XYTO2
Mojave threeawn	Aristida californica	ARCA9
Mojave yucca	Yucca schidigera	YUSC2
monkeyflower	Mimulus	MIMUL
mouse's eye	Bernardia myricifolia	BEMY
Muller oak	Quercus cornelius-mulleri	QUCO7
narrowleaf bedstraw	Galium angustifolium	GAAN2
narrowleaf goldenbush	Ericameria linearifolia	ERLI6
needle grama	Bouteloua aristidoides	BOAR
Nevada dalea	Psoralea polydenius	PSPO
Nevada jointfir	Ephedra nevadensis	EPNE
New Mexico Plumeseed	Rafinesquia neomexicana	RANE
New Mexico silverbush	Argythamnia neomexicana	ARNE2
ocotillo	Fouquieria splendens	FOSP2
other shrubs		2SD
other annual forbs		2FA
other annual grasses		2GA
other perennial forbs		2FP
other perennial grasses		2GP
other shrubs		2SHRUB
paleface	Hibiscus denudatus	HIDE
Panamint crptantha	Cryptantha angustifolia	CRAN4
Parish's goldeneye	Viguiera parishii	VIPA14
Parry's beargrass	Nolina parryi	NOPA
Parry's false prairie-flower	Marina parryi	MAPA7
Parry's jujube	Ziziphus parryi	ZIPA
Parry's wirelettuce	Stephanomeria parryi	STPA3
peach thorn	Lycium cooperi	LYCO2
pepperweed	Lepidium	LEPID
Phacelia	Phacelia	PHACE
pincushion	Chaenactis	CHAEN
pincushion flower	Chaenactis fremontii	CHFR
plains pricklypear	Opuntia polyacantha	OPPO
popcornflower	Plagiobothrys	PLAGI
prairie clover	Dalea	DALEA
pricklypear	Opuntia	OPUNT
purple threeawn	Aristida purpurea	ARPU9
purplemat	Nama demissum	NADE
pygmy poppy	Eschscholzia minutiflora	ESMI
queen's-root	Stillingia linearifolia	STLI3
rayless goldenhead	Acamptopappus sphaerocephalus	ACSP
red brome	Bromus rubens	BRRU2
redroot cryptantha	Cryptantha micrantha	CRMI
redstem stork's bill	Erodium cicutarium	ERCI6
rubber rabbitbrush	Ericameria nauseosa	ERNA10
sand fringe-pod	Thysanocarpus curvipes	THCU
sand verbena	Abronia	ABRON
Sandberg bluegrass	Poa secunda	POSE
sandmat	Chamaesyce	CHAMA15
Schott's dalea	Psoralea schottii	PSSC5
Schott's pygmycedar	Peucephyllum schottii	PESC4
shrubby deervetch	Lotus rigidus	LORI3
singleleaf pinyon	Pinus monophylla	PIMO
sixweeks grama	Bouteloua barbata	BOBA2
sixweeks threeawn	Aristida adscensionis	ARAD
small wirelettuce	Stephanomeria exigua	STEX
smoketree	Psoralea spinosa	PSSP3
smooth desertydandelion	Malacothrix glabrata	MAGL3
snakeweed	Gutierrezia	GUTIE
sowthistle		
desertydandelion	Malacothrix sonchoides	MASO
spineflower	Chorizanthe	CHORI2
spiny hopsage	Grayia spinosa	GRSP

# Soil Survey of Joshua Tree National Park, California

Table 8.-Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Common Name-Continued

Local common name	Scientific name	Plant symbol
spiny menodora	<i>Menodora spinescens</i>	MESP2
spurge	<i>Euphorbia</i>	EUPHO
strawberry cactus	<i>Mammillaria dioica</i>	MADI3
suncup	<i>Camissonia</i>	CAMIS
sweetbush	<i>Bebbia juncea</i>	BEJU
teddybear cholla	<i>Cylindropuntia bigelovii</i>	CYBI9
threadleaf snakeweed	<i>Gutierrezia microcephala</i>	GUMI
Thurber's sandpaper plant	<i>Petalonyx thurberi</i>	PETH4
trailing windmills	<i>Allionia incarnata</i>	ALIN
trefoil	<i>Lotus</i>	LOTUS
turpentine bush	<i>Ericameria laricifolia</i>	ERLA12
turpentinebroom	<i>Thamnosma montana</i>	THMO
Virgin River brittlebush	<i>Encelia virginensis</i>	ENVI
water jacket	<i>Lycium andersonii</i>	LYAN
western tansymustard	<i>Descurainia pinnata</i>	DEPI
whisperingbells	<i>Emmenanthe penduliflora</i>	EMPE
white bursage	<i>Ambrosia dumosa</i>	AMDU2
white ratany	<i>Krameria grayi</i>	KRGR
whitedaisy tidytips	<i>Layia glandulosa</i>	LAGL5
whitemargin sandmat	<i>Chamaesyce albomarginata</i>	CHAL11
Wiggin's cholla	<i>Cylindropuntia echinocarpa</i>	CYEC3
wishbone-bush	<i>Mirabilis laevis</i> var. <i>villosa</i>	MILAV
wolly easterbonnets	<i>Antheropeas wallacei</i>	ANWA
wollystar	<i>Eriastrum</i>	ERIAS
woody crinklemat	<i>Tiquilia canescens</i>	TICA3
wooly bluestar	<i>Amsonia tomentosa</i>	AMTO2

# Soil Survey of Joshua Tree National Park, California

Table 9.-Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Plant Symbol

(Plants displayed occur within the National Soils Information System [NASIS]  
plant tables used for the soil survey area. The scientific and common  
names are referenced at the USDA PLANTS database: [plants.usda.gov](http://plants.usda.gov))

Local common name	Scientific name	Plant symbol
forb, annual		2FA
other annual forbs		2FA
forb, perennial		2FP
other perennial forbs		2FP
annual grasses		2GA
other annual grasses		2GA
grass, perennial		2GP
other perennial grasses		2GP
other shrubs		2SD
other shrubs		2SHRUB
sand verbena	Abronia	ABRON
catclaw acacia	Acacia greggii	ACGR
Indian ricegrass	Achnatherum hymenoides	ACHY
rayless goldenhead	Acamptopappus sphaerocephalus	ACSP
desert needlegrass	Achnatherum speciosum	ACSP12
trailing windmills	Allionia incarnata	ALIN
burrobush	Ambrosia dumosa	AMDU2
white bursage	Ambrosia dumosa	AMDU2
fiddleneck	Amsinckia	AMSIN
bristly fiddleneck	Amsinckia tessellata	AMTE3
wooly bluestar	Amsonia tomentosa	AMTO2
wolly easterbonnets	Antheropeas wallacei	ANWA
sixweeks threeawn	Aristida adscensionis	ARAD
Mojave threeawn	Aristida californica	ARCA9
bigberry manzanita	Arctostaphylos glauca	ARGL4
New Mexico silverbush	Argythamnia neomexicana	ARNE2
purple threeawn	Aristida purpurea	ARPU9
milkweed	Asclepias	ASCLE
desertholly	Atriplex hymenelytra	ATHY
cattle saltbush	Atriplex polycarpa	ATPO
desert marigold	Baileya multiradiata	BAMU
sweetbush	Bebbia juncea	BEJU
mouse's eye	Bernardia myricifolia	BEMY
needle grama	Bouteloua aristidoides	BOAR
sixweeks grama	Bouteloua barbata	BOBA2
cane bluestem	Bothriochloa barbinodis	BOBA3
compact brome	Bromus madritensis	BRMA3
brome	Bromus	BROMU
red brome	Bromus rubens	BRRU2
cheatgrass	Bromus tectorum	BRTE
Asian Mustard	Brassica tournefortii	BRT0
suncup	Camissonia	CAMIS
Abrams' sandmat	Chamaesyce abramsiana	CHAB2
pincushion	Chaenactis	CHAEN
whitemargin sandmat	Chamaesyce albomarginata	CHAL11
sandmat	Chamaesyce	CHAMA15
brittle spineflower	Chorizanthe brevicornu	CHBR
pincushion flower	Chaenactis fremontii	CHFR
desert willow	Chilopsis linearis	CHLI2
spineflower	Chorizanthe	CHORI2
devil's spineflower	Chorizanthe rigida	CHRI
bladderpod spiderflower	Cleome isomeris	CLIS
blackbrush	Coleogyne ramosissima	CORA
Panamint crptantha	Cryptantha angustifolia	CRAN4
California croton	Croton californicus	CRCA5
redroot cryptantha	Cryptantha micrantha	CRMI
cryptantha	Cryptantha	CRYPT
desert dodder	Cuscuta denticulata	CUDE2
coyote gourd	Cucurbita palmata	CUPA

# Soil Survey of Joshua Tree National Park, California

Table 9.—Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Plant Symbol—Continued

Local common name	Scientific name	Plant symbol
teddybear cholla	<i>Cylindropuntia bigelovii</i>	CYBI9
Wiggin's cholla	<i>Cylindropuntia echinocarpa</i>	CYEC3
branched pencil cholla	<i>Cylindropuntia ramosissima</i>	CYRA9
desert thorn-apple	<i>Datura discolor</i>	DADI2
prairie clover	<i>Dalea</i>	DALEA
low woollygrass	<i>Dasyochloa pulchella</i>	DAPU7
larkspur	<i>Delphinium</i>	DELPH
western tansymustard	<i>Descurainia pinnata</i>	DEPI
Engelmann's hedgehog cactus	<i>Echinocereus engelmannii</i>	ECEN
cottontop cactus	<i>Echinocactus polycephalus</i>	ECPO2
whisperingbells	<i>Emmenanthe penduliflora</i>	EMPE
Acton's brittlebush	<i>Encelia actonii</i>	ENAC
brittlebush	<i>Encelia</i>	ENCEL
brittlebush	<i>Encelia farinosa</i>	ENFA
Virgin River brittlebush	<i>Encelia virginensis</i>	ENVI
California jointfir	<i>Ephedra californica</i>	EPCA2
Nevada jointfir	<i>Ephedra nevadensis</i>	EPNE
cutleaf filaree	<i>Erodium cicutarium</i>	ERCI6
redstem stork's bill	<i>Erodium cicutarium</i>	ERCI6
Cooper's goldenbush	<i>Ericameria cooperi</i>	ERCO23
flatcrown buckwheat	<i>Eriogonum deflexum</i>	ERDE6
California buckwheat	<i>Eriogonum fasciculatum</i>	ERFA2
Eastern Mojave buckwheat	<i>Eriogonum fasciculatum</i>	ERFA2
Eastern Mojave buckwheat	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	ERFAP
wollystar	<i>Eriastrum</i>	ERIAS
goldenbush	<i>Ericameria</i>	ERICA2
desert trumpet	<i>Eriogonum inflatum</i>	ERIN4
buckwheat	<i>Eriogonum</i>	ERIOG
turpentine bush	<i>Ericameria laricifolia</i>	ERLA12
narrowleaf goldenbush	<i>Ericameria linearifolia</i>	ERLI6
rubber rabbitbrush	<i>Ericameria nauseosa</i>	ERNA10
Mojave rabbitbrush	<i>Ericameria paniculata</i>	ERPA29
green rabbitbrush	<i>Ericameria teretifolia</i>	ERTE18
bastardsage	<i>Eriogonum wrightii</i>	ERWR
cushion foxtail cactus	<i>Escobaria alversonii</i>	ESAL2
Eschscholzia poppy	<i>Eschscholzia</i>	ESCHS
desert poppy	<i>Eschscholzia glyptosperma</i>	ESGL
pygmy poppy	<i>Eschscholzia minutiflora</i>	ESMI
spurge	<i>Euphorbia</i>	EUPHO
California fagonbush	<i>Fagonia laevis</i>	FALA
California barrel cactus	<i>Ferocactus cylindraceus</i>	FECY
ocotillo	<i>Fouquieria splendens</i>	FOSP2
hairy milkweed	<i>Funastrum hirtellum</i>	FUHI
narrowleaf bedstraw	<i>Galium angustifolium</i>	GAAN2
hairy desertsunflower	<i>Geraea canescens</i>	GECA2
gilia	<i>Gilia</i>	GILIA
spiny hopsage	<i>Grayia spinosa</i>	GRSP
threadleaf snakeweed	<i>Gutierrezia microcephala</i>	GUMI
broom snakeweed	<i>Gutierrezia sarothrae</i>	GUSA2
snakeweed	<i>Gutierrezia</i>	GUTIE
paleface	<i>Hibiscus denudatus</i>	HIDE
desert lavender	<i>Hyptis emoryi</i>	HYEM
burrobrush	<i>Hymenoclea salsola</i>	HYSA
California juniper	<i>Juniperus californica</i>	JUCA7
littleleaf ratany	<i>Krameria erecta</i>	KRER
white ratany	<i>Krameria grayi</i>	KRGR
whitedaisy tidytips	<i>Layia glandulosa</i>	LAGL5
Great Basin langloisia	<i>Langloisia setosissima</i>	LASE3
creosote bush	<i>Larrea tridentata</i>	LATR2
golden linanthus	<i>Leptosiphon aureus</i> ssp. <i>aureus</i>	LEAUA3
desert pepperweed	<i>Lepidium fremontii</i>	LEFR2
pepperweed	<i>Lepidium</i>	LEPID

# Soil Survey of Joshua Tree National Park, California

Table 9.-Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Plant Symbol-Continued

Local common name	Scientific name	Plant symbol
California broomsage	<i>Lepidospartum squamatum</i>	LESQ
granite prickly phlox	<i>Linanthus pungens</i>	LIPU11
desert calico	<i>Loeseliastrum matthewsii</i>	LOMA10
shrubby deervetch	<i>Lotus rigidus</i>	LORI3
trefoil	<i>Lotus</i>	LOTUS
grape soda lupine	<i>Lupinus excubitus</i>	LUEX
lupine	<i>Lupinus</i>	LUPIN
water jacket	<i>Lycium andersonii</i>	LYAN
peach thorn	<i>Lycium cooperi</i>	LYCO2
strawberry cactus	<i>Mammillaria dioica</i>	MADI3
smooth desertdandelion	<i>Malacothrix glabrata</i>	MAGL3
Parry's false prairie-flower	<i>Marina parryi</i>	MAPA7
sowthistle	<i>Malacothrix sonchoides</i>	MASO
desertdandelion	<i>Malacothrix sonchoides</i>	MASO
blazingstar	<i>Mentzelia</i>	MENTZ
spiny menodora	<i>Menodora spinescens</i>	MESP2
wishbone-bush	<i>Mirabilis laevis</i> var. <i>villosa</i>	MILA5
monkeyflower	<i>Mimulus</i>	MIMUL
four o'clock	<i>Mirabilis</i>	MIRAB
daisy desertstar	<i>Monoptilon bellidiiforme</i>	MOBE
Mojave desertstar	<i>Monoptilon bellioides</i>	MOBE2
ghost flower	<i>Mohavea confertiflora</i>	MOCO
bush muhly	<i>Muhlenbergia porteri</i>	MUP02
purplemat	<i>Nama demissum</i>	NADE
Bigelow's nolina	<i>Nolina bigelovii</i>	NOBI
Parry's beargrass	<i>Nolina parryi</i>	NOPA
birdcage evening primrose	<i>Oenothera deltoidea</i>	OEDE2
evening-primrose	<i>Oenothera</i>	OENOT
desert ironwood	<i>Olneya tesota</i>	OLTE
beavertail pricklypear	<i>Opuntia basilaris</i>	OPBA2
plains pricklypear	<i>Opuntia polyacantha</i>	OPPO
pricklypear	<i>Opuntia</i>	OPUNT
desert palafox	<i>Palafoxia arida</i>	PAAR8
blue paloverde	<i>Parkinsonia florida</i>	PAFL6
combseed	<i>Pectocarya</i>	PECTO
chuckwalla combseed	<i>Pectocarya heterocarpa</i>	PEHE
manybristle cinchweed	<i>Pectis papposa</i>	PEPA2
curvenut combseed	<i>Pectocarya recurvata</i>	PERE
Schott's pygmycedar	<i>Peucephyllum schottii</i>	PESC4
Thurber's sandpaper plant	<i>Petalonyx thurberi</i>	PETH4
Phacelia	<i>Phacelia</i>	PHACE
calthaleaf phacelia	<i>Phacelia calthifolia</i>	PHCA2
distant phacelia	<i>Phacelia distans</i>	PHDI
mistletoe	<i>Phoradendron</i>	PHORA
lacy phacelia	<i>Phacelia tanacetifolia</i>	PHTA
singleleaf pinyon	<i>Pinus monophylla</i>	PIMO
popcornflower	<i>Plagiobothrys</i>	PLAGI
desert Indianwheat	<i>Plantago ovata</i>	PLOV
big galleta	<i>Pleuraphis rigida</i>	PLRI3
desert polygala	<i>Polygala acanthoclada</i>	POAC2
Sandberg bluegrass	<i>Poa secunda</i>	POSE
desert almond	<i>Prunus fasciculata</i>	PRFA
honey mesquite	<i>Prosopis glandulosa</i>	PRGL2
Mojave indigobush	<i>Psoralea arborescens</i>	PSAR4
dyebush	<i>Psoralea emoryi</i>	PSEM
dalea	<i>Psoralea</i>	PSORO
Nevada dalea	<i>Psoralea polydenius</i>	PSPO
Schott's dalea	<i>Psoralea schottii</i>	PSSC5
smoketree	<i>Psoralea spinosa</i>	PSSP3
desert bitterbrush	<i>Purshia glandulosa</i>	PUGL2
Muller oak	<i>Quercus cornelius-mulleri</i>	QUCO7



# Soil Survey of Joshua Tree National Park, California

Table 9.-Index of Common and Scientific Plant Names and Plant Symbols  
Sorted by Plant Symbol-Continued

Local common name	Scientific name	Plant symbol
New Mexico Plumeseed	Rafinesquia neomexicana	RANE
chia	Salvia columbariae	SAC06
Mexican bladdersage	Salazaria mexicana	SAME
Mojave sage	Salvia mohavensis	SAMO3
common Mediterranean		
grass	Schismus barbatus	SCBA
Mediterranean grass	Schismus	SCHIS
desertsenna	Senna armata	SEAR8
jojoba	Simmondsia chinensis	SICH
desert globemallow	Sphaeralcea ambigua	SPAM2
small wirelettuce	Stephanomeria exigua	STEX
queen's-root	Stillingia linearifolia	STLI3
Parry's wirelettuce	Stephanomeria parryi	STPA3
brownplume wirelettuce	Stephanomeria pauciflora	STPA4
desert princesplume	Stanleya pinnata	STPI
Mojave seablite	Suaeda moquinii	SUMO
Hall's shrubby-spurge	Tetracoccus hallii	TEHA
Mojave cottonthorn	Tetradymia stenolepis	TEST2
sand fringe pod	Thysanocarpus curvipes	THCU
turpentinebroom	Thamnosma montana	THMO
woody crinklemat	Tiquilia canescens	TICA3
American Threefold	Trixis californica	TRCA8
Parish's goldeneye	Viguiera parishii	VIPA14
Mojave woodyaster	Xylorhiza tortifolia	XYTO2
Joshua tree	Yucca brevifolia	YUBR
Mojave yucca	Yucca schidigera	YUSC2
lotebush	Ziziphus obtusifolia	ZIOB
Parry's jujube	Ziziphus parryi	ZIPA

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification

(Land capability is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. "N" indicates nonirrigated areas, and "I" irrigated)

Map symbol and soil name	Land capability	
	N	I
1220:		
Jadestorm-----	7e	---
Blackeagle, cool-----	7e	---
Rock outcrop.		
1225:		
Blackeagle-----	7e	---
Rock outcrop.		
1230:		
Jadestorm-----	7e	---
Jadestorm, cool-----	7e	---
Rock outcrop.		
1240:		
Meccapass-----	7e	---
Bulletproof-----	7e	---
Rock outcrop.		
1241:		
Meccapass-----	7e	---
Seanna-----	7e	---
Contactmine, dry-----	7e	---
1242:		
Meccapass-----	7e	---
Jadestorm-----	8	---
Rock outcrop.		
1250:		
Ironlung-----	8	---
Ironlung, cool-----	8	---
Rock outcrop.		
1255:		
Goldenhills-----	8	---
Bulletproof-----	7e	---
Fanhill-----	8	---
Whiterobe-----	8	---

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
1260:		
Whiterobe-----	8	---
Bigbernie-----	8	---
Whiterobe, cool-----	8	---
1410:		
Missionwell-----	7e	---
Rock outcrop.		
Missionwell, high elevation-----	7e	---
1415:		
Bolero-----	8	---
Rock outcrop.		
1504:		
Rizzo, rarely flooded, stony-----	7e	---
Rizzo, occasionally flooded, stony-----	7e	---
1510:		
Carrizo, very gravelly sandy loam-----	7s	---
1511:		
Carrizo, channeled-----	7s	---
Carrizo, occasionally flooded-----	7s	---
1512:		
Carrizo, extremely gravelly sandy loam-----	7s	---
1513:		
Carrizo-----	7s	---
Carrizo, occasionally flooded, channeled-----	7e	---
Rubylee-----	7s	---
1514:		
Carrizo, rarely flooded-----	7e	---
Pintobasin, fine sandy loam-----	7e	---
Rubylee-----	7s	---
1515:		
Pintobasin-----	7s	---
Carrizo, occasionally flooded-----	7s	---
1516:		
Pintobasin, fine sandy loam-----	7e	---
1517:		
Pintobasin-----	7s	---
Dalelake-----	7s	---

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
1520: Pintobasin, loamy sand-----	7s	---
1522: Pintobasin, rarely flooded-----	7e	---
1523: Pintobasin, rarely flooded-----	7s	---
Aquapeak-----	7s	---
Pintobasin, occasionally flooded-----	7s	---
1524: Pintobasin, rarely flooded-----	7s	---
1525: Pintobasin, occasionally flooded-----	7s	---
Pintobasin, rarely flooded-----	7s	---
1526: Pintobasin, rarely flooded-----	7s	---
Joetree-----	7s	---
Patscamp-----	7e	---
1527: Pintobasin, moist-----	7e	---
1530: Dalelake, fine sand-----	7s	---
1531: Dalelake-----	7s	---
Pintobasin, rarely flooded-----	7e	---
1540: Carrizo, very rarely flooded-----	7s	---
Carrizo, stable-----	7s	---
Carrizo, occasionally flooded, rocky surface-----	7s	---
Russiroks-----	7s	---
1541: Carrizo, stable-----	7e	---
Cambidic Haplodurids-----	7e	---
1542: Carrizo, very rarely flooded-----	7s	---
Carrizo, occasionally flooded-----	7s	---
1550: Buzzardsprings, stable-----	7e	---
Coxpin-----	7e	---
Dalelake-----	7s	---

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
1555:		
Goldrose-----	7s	---
Carsitas, very rarely flooded-----	7s	---
Chemwash, rarely flooded-----	7s	---
2003:		
Emptygun-----	7e	---
2060:		
Joetree, very rarely flooded-----	7s	---
Dalelake-----	7e	---
Pintobasin, fine sandy loam-----	7s	---
2065:		
Dalelake-----	7s	---
Aquapeak-----	7s	---
Coxpin-----	7e	---
2067:		
Aquapeak, overblown-----	7e	---
Buzzardsprings-----	7e	---
Dalelake, thick sandy surface-----	7s	---
Buzzardsprings, steep-----	7e	---
2068:		
Aquapeak-----	7s	---
Carpetflat, nongravelly surface-----	7e	---
Pintobasin-----	7s	---
2070:		
Missionsweet-----	7e	---
Carpetflat-----	7e	---
2075:		
Oldale-----	7e	---
Missionsweet-----	7e	---
2076:		
Oldale-----	7e	---
Carrizo-----	7s	---
2077:		
Oldale-----	7e	---
Carrizo-----	7s	---
Carrizo, very rarely flooded-----	7s	---

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
2085:		
Rainbowsend-----	7e	---
Goldenbell-----	7e	---
2090:		
Deprave-----	7s	---
Rockhound-----	7s	---
Rizzo-----	7e	---
2091:		
Deprave-----	7s	---
Roostertail-----	7e	---
2100:		
Perurose-----	7e	---
Coxpin-----	7e	---
Pintobasin, gravelly surface-----	7s	---
2101:		
Perurose, rarely flooded-----	7e	---
Pintobasin, rarely flooded-----	7s	---
2110:		
Descent-----	7s	---
Descent, stable-----	7s	---
2111:		
Descent, warm-----	7e	---
Rubylee, very rarely flooded-----	7e	---
2120:		
Rizzo, rarely flooded-----	7s	---
Deprave-----	7s	---
Rizzo, frequently flooded-----	7s	---
2121:		
Rizzo, rubbly-----	7e	---
2130:		
Goldenbell-----	7e	---
Descent-----	7s	---
2140:		
Rockhound, cobbly-----	7s	---
2402:		
Rizzo-----	7s	---
Rizzo, frequently flooded-----	7s	---



# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
2403:		
Rizzo-----	7s	---
Rizzo, occasionally flooded-----	7s	---
2404:		
Rizzo, occasionally flooded-----	7s	---
Rizzo, very rarely flooded-----	7s	---
2405:		
Carrizo, rarely flooded-----	7e	---
Carrizo, occasionally flooded-----	7s	---
2406:		
Pintobasin, frequently flooded-----	7s	---
Carrizo, occasionally flooded-----	7s	---
2407:		
Pintobasin, rarely flooded-----	7s	---
Carrizo, occasionally flooded-----	7s	---
Carrizo, frequently flooded-----	7s	---
2408:		
Rizzo, frequently flooded-----	7s	---
Rizzo, very rarely flooded-----	7s	---
2409:		
Rizzo, frequently flooded-----	7s	---
Chemwash, frequently flooded-----	7s	---
Carsitas, occasionally flooded, braided-----	7s	---
2420:		
Carsitas, frequently flooded-----	7s	---
Carsitas, occasionally flooded-----	7s	---
Carsitas, rarely flooded-----	7s	---
2421:		
Carsitas, very rarely flooded-----	7s	---
Carsitas, rarely flooded-----	7s	---
2431:		
Chemwash, frequently flooded, braided-----	7s	---
Chemwash, frequently flooded-----	7s	---
2440:		
Rizzo-----	7e	---
Rizzo, occasionally flooded-----	7s	---
Rizzo, extremely stony-----	7e	---

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
2715:		
Dalelake-----	7s	---
Sheephole-----	7s	---
Pintobasin-----	7s	---
2716:		
Dalelake, steep-----	7s	---
Dalelake-----	7s	---
2717:		
Dalelake-----	7e	---
Rock outcrop.		
Buzzardsprings, fine sand-----	7e	---
2718:		
Dalelake-----	7s	---
Sheephole, gravelly surface-----	7s	---
2820:		
Rock outcrop.		
Impedimenta-----	7s	---
2825:		
Rock outcrop.		
Supplymine-----	7e	---
Bolero, dry-----	8	---
Ironage-----	7e	---
2830:		
Rock outcrop.		
Blackeagle, cool-----	8	---
2835:		
Rock outcrop.		
Blackeagle-----	8	---
2840:		
Rock outcrop.		
Jadestorm-----	7e	---
3110:		
Coppermine, cool-----	7e	---
Stranger-----	8	---
3120:		
Aguilareal-----	7e	---
Blackeagle-----	7e	---
Rock outcrop.		

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
3213:		
Dalvord-----	7e	---
Aguilareal-----	8	---
Rock outcrop.		
3242:		
Langwell-----	7e	---
Rock outcrop.		
Helendale, cool-----	7e	---
3285:		
Pinecity-----	7e	---
Contactmine-----	7e	---
Desertqueen-----	7e	---
Rock outcrop.		
3286:		
Pinecity, gravelly loamy sand-----	8	---
3291:		
Smithcanyon-----	7e	---
Stubbespring-----	7e	---
Rock outcrop.		
3292:		
Smithcanyon-----	7e	---
Pinecity-----	7e	---
Rock outcrop.		
3293:		
Smithcanyon-----	7e	---
Pinecity-----	7e	---
3294:		
Smithcanyon, dry-----	8	---
3295:		
Desertqueen, dry-----	7e	---
Hexie-----	7e	---
Rock outcrop.		
3296:		
Desertqueen-----	7e	---
Pinecity-----	7e	---

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
3297:		
Desertqueen, warm-----	7e	---
Contactmine, dry-----	7e	---
Seanna, dry-----	7e	---
3325:		
Ironped, warm-----	7e	---
Rock outcrop.		
Hexie-----	7e	---
Ironped-----	8	---
3335:		
Xeric Torriorthents-----	7e	---
Rock outcrop.		
Xeric Torriorthents, warm-----	7e	---
3336:		
Xeric Torriorthents-----	7e	---
Bigbernie-----	8	---
3340:		
Seanna-----	7e	---
Grubstake, moist-----	8	---
Pinecity-----	8	---
3345:		
Bigcanyon-----	8	---
Bigcanyon, cool-----	8	---
3440:		
Pacific Mesa, steep-----	7e	---
Pacific Mesa-----	7e	---
3509:		
Cajon, very rarely flooded-----	7s	---
Friedliver-----	7e	---
3525:		
Cajon-----	7s	---
Friedliver-----	7e	---
3526:		
Cajon-----	7s	---
Hypoint-----	7e	---
Arizo, occasionally flooded-----	7s	---

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
3611: Burntshack, sand surface-----	7e	---
Burntshack-----	7e	---
3612: Burntshack-----	7e	---
Burntshack, occasionally flooded-----	7e	---
3676: Morongo, loamy sand, very rarely flooded-----	7e	---
3677: Morongo-----	7s	---
3679: Morongo, cool-----	7e	---
Jumborox-----	7e	---
3680: Morongo-----	7e	---
3681: Morongo, very rarely flooded-----	7s	---
Jumborox, dry-----	7e	---
3682: Morongo, cool-----	7e	---
Jumborox-----	7e	---
Urban land.		
3683: Morongo-----	7e	---
Bluecut, very rarely flooded-----	7e	---
3684: Morongo, warm-----	7s	---
3685: Morongo, cool-----	7e	---
Desertqueen, undulating-----	7e	---
3690: Nasagold-----	7e	---
3695: Gocougs-----	7e	---
4031: Crosgrain-----	7e	---
Crackerjack-----	7e	---
Pinkcan, dry-----	7e	---

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
4041:		
Silvermine-----	7e	---
Helendale-----	7e	---
Burntshack, very rarely flooded-----	7e	---
4064:		
Gravesumit-----	7e	---
Helendale, sandy surface-----	7e	---
4071:		
Helendale-----	7e	---
Desertqueen, very rarely flooded-----	7e	---
4091:		
Littlefargo-----	7e	---
4245:		
Bluecut-----	7e	---
Morongo, very rarely flooded-----	7s	---
Yander, very rarely flooded-----	7s	---
4260:		
Minhoyt-----	8	---
Corbilt, rarely flooded-----	7e	---
4265:		
Werewolf, warm-----	7e	---
4270:		
Yuccabutte-----	7e	---
4271:		
Yuccabutte, warm-----	7e	---
Arizo, rarely flooded-----	7s	---
4275:		
Pinkcan-----	7e	---
Werewolf-----	7e	---
Gocougs, warm-----	7e	---
4280:		
Mekkadale-----	7e	---
Edalph, warm-----	7e	---
4285:		
Typic Argidurids-----	7e	---
Coppermine-----	7e	---
Minhoyt, warm-----	8	---



# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
4403:		
Arizo, rarely flooded, channeled-----	7s	---
Arizo, rarely flooded-----	7s	---
Arizo-----	7s	---
4440:		
Dragonwash, occasionally flooded-----	7s	---
Dragonwash, frequently flooded-----	7s	---
4450:		
Morongo, occasionally flooded-----	7s	---
Morongo, frequently flooded-----	7s	---
4605:		
Pinecity, moist-----	7s	---
4606:		
Pinecity-----	7s	---
Rock outcrop.		
4607:		
Pinecity-----	7s	---
4608:		
Pinecity-----	7e	---
Rock outcrop.		
4610:		
Desertqueen-----	7e	---
Jumborox, warm-----	7e	---
Rock outcrop.		
4615:		
Desertqueen, cool-----	7e	---
Jumborox-----	7e	---
Rock outcrop.		
4620:		
Stranger-----	8	---
Rock outcrop.		
Grubstake, moist-----	7e	---
4625:		
Grinder-----	8	---
Grinder, cool-----	8	---
Pinkcan, cool-----	7e	---

# Soil Survey of Joshua Tree National Park, California

Table 10.—Land Capability Classification—Continued

Map symbol and soil name	Land capability	
	N	I
4630: Thunderclap-----	7s	---
Smithcanyon-----	7s	---
4804: Rock outcrop.		
Ironped-----	8	---
Pinecity-----	8	---
4805: Rock outcrop.		
Ironped, cool-----	7e	---
4806. Rock outcrop		
4811: Rock outcrop.		
Pioneertown-----	8	---
4825: Rock outcrop.		
Grubstake-----	7e	---
Cajon, rarely flooded-----	7s	---
Stranger, warm-----	8	---
4830: Rock outcrop.		
Pinecity, cool-----	7s	---
4900: Rock outcrop.		
Aguilareal-----	8	---
Lostpalms-----	8	---

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part I (Planting)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1220:							
Jadestorm-----	60	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Restrictive layer	0.50	Slope	1.00		
		Sandiness	0.50	Sandiness	0.50		
Blackeagle, cool----	20	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Sandiness	0.50	Slope	1.00		
		Slope	0.50	Sandiness	0.50		
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1225:							
Blackeagle-----	65	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Sandiness	0.50	Slope	1.00		
		Slope	0.50	Sandiness	0.50		
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1230:							
Jadestorm-----	45	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Restrictive layer	0.50	Rock fragments	1.00		
		Sandiness	0.50	Sandiness	0.50		
		Slope	0.50				
Jadestorm, cool----	20	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Restrictive layer	0.50	Rock fragments	1.00		
		Sandiness	0.50	Sandiness	0.50		
		Slope	0.50				
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1240:							
Meccapass-----	45	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Slope	0.50	Rock fragments	1.00		
Bulletproof-----	20	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Sandiness	0.50	Rock fragments	1.00		
		Slope	0.50	Sandiness	0.50		
		Restrictive layer	0.50				
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1241:							
Meccapass-----	45	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Slope	0.50	Slope	1.00		

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting	Value	Suitability for mechanical planting	Value	Soil rutting hazard	
		Rating class and limiting features		Rating class and limiting features		Rating class and limiting features	Value
1241:							
Seanna-----	20	Moderately suited		Unsuited		Moderate	
		Restrictive layer	0.50	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
Contactmine, dry----	20	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Slope	1.00	Low strength	0.50
		Slope	0.50	Rock fragments	1.00		
1242:							
Meccapass-----	40	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Slope	0.50	Slope	1.00		
Jadestorm-----	25	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Restrictive layer	0.50	Slope	1.00		
		Sandiness	0.50	Sandiness	0.50		
		Slope	0.50				
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1250:							
Ironlung-----	50	Poorly suited		Unsuited		Moderate	
		Restrictive layer	0.75	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
		Sandiness	0.50	Sandiness	0.50		
		Slope	0.50				
Ironlung, cool-----	20	Poorly suited		Unsuited		Moderate	
		Restrictive layer	0.75	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
		Sandiness	0.50	Sandiness	0.50		
		Slope	0.50				
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1255:							
Goldenhills-----	40	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Sandiness	0.50	Rock fragments	1.00		
		Slope	0.50	Sandiness	0.50		
Bulletproof-----	15	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Slope	0.50	Rock fragments	1.00		
Fanhill-----	15	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Sandiness	0.50	Rock fragments	1.00		
		Slope	0.50	Sandiness	0.50		
Whiterobe-----	15	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Slope	1.00	Low strength	0.50
		Sandiness	0.50	Rock fragments	1.00		
		Slope	0.50	Sandiness	0.50		

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1260:							
Whiterobe-----	45	Moderately suited		Unsuited		Moderate	
		Sandiness	0.50	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
		Slope	0.50	Sandiness	0.50		
Bigbernie-----	20	Moderately suited		Unsuited		Moderate	
		Rock fragments	0.50	Slope	1.00	Low strength	0.50
		Sandiness	0.50	Rock fragments	0.75		
		Slope	0.50	Sandiness	0.50		
Whiterobe, cool----	15	Moderately suited		Unsuited		Moderate	
		Sandiness	0.50	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
		Slope	0.50	Sandiness	0.50		
1410:							
Missionwell-----	50	Unsuited		Unsuited		Moderate	
		Restrictive layer	1.00	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Restrictive layer	1.00		
		Sandiness	0.50	Rock fragments	0.75		
				Sandiness	0.50		
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Missionwell, high elevation-----	15	Unsuited		Unsuited		Moderate	
		Restrictive layer	1.00	Restrictive layer	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
		Sandiness	0.50	Slope	0.75		
				Sandiness	0.50		
1415:							
Bolero-----	60	Unsuited		Unsuited		Slight	
		Rock fragments	1.00	Slope	1.00	Strength	0.10
		Sandiness	0.50	Rock fragments	1.00		
		Slope	0.50	Sandiness	0.50		
Rock outcrop-----	20	Not rated		Not rated		Not rated	
1504:							
Rizzo, rarely flooded, stony-----	50	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Rock fragments	1.00	Low strength	0.50
		Sandiness	0.50	Sandiness	0.50		
				Slope	0.50		
Rizzo, occasionally flooded, stony-----	35	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Rock fragments	1.00	Low strength	0.50
		Sandiness	0.50	Sandiness	0.50		
				Slope	0.50		
1510:							
Carrizo, very gravelly sandy loam	85	Moderately suited		Poorly suited		Slight	
		Rock fragments	0.50	Rock fragments	0.75	Strength	0.10
		Sandiness	0.50	Sandiness	0.50		

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1511: Carrizo, channeled--	75	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
Carrizo, occasionally flooded-----	15	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
1512: Carrizo, extremely gravelly sandy loam	80	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Slight Strength	0.10
1513: Carrizo-----	60	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
Carrizo, occasionally flooded, channeled-	20	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Slight Strength	0.10
Rubylee-----	15	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
1514: Carrizo, rarely flooded-----	40	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50
Pintobasin, fine sandy loam-----	30	Well suited		Well suited		Moderate Low strength	0.50
Rubylee-----	15	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
1515: Pintobasin-----	80	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope Rock fragments	0.50 0.50 0.50	Moderate Low strength	0.50
Carrizo, occasionally flooded-----	15	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
1516: Pintobasin, fine sandy loam-----	90	Well suited		Well suited		Moderate Low strength	0.50



# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1517: Pintobasin-----	65	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
Dalelake-----	25	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1520: Pintobasin, loamy sand-----	80	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
1522: Pintobasin, rarely flooded-----	85	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
1523: Pintobasin, rarely flooded-----	50	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
Aquapeak-----	25	Moderately suited Rock fragments	0.50	Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
Pintobasin, occasionally flooded-----	20	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
1524: Pintobasin, rarely flooded-----	90	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
1525: Pintobasin, occasionally flooded-----	45	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50
Pintobasin, rarely flooded-----	35	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
1526: Pintobasin, rarely flooded-----	55	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
Joetree-----	20	Well suited		Well suited		Moderate Low strength	0.50
Patscamp-----	15	Well suited		Well suited		Moderate Low strength	0.50

Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting	Value	Suitability for mechanical planting	Value	Soil rutting hazard	
		Rating class and limiting features		Rating class and limiting features		Rating class and limiting features	Value
1527: Pintobasin, moist---	90	Well suited		Moderately suited Rock fragments Slope	0.50 0.50	Moderate Low strength	0.50
1530: Dalelake, fine sand-	85	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
1531: Dalelake-----	60	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Pintobasin, rarely flooded-----	30	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
1540: Carrizo, very rarely flooded-----	35	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Slight Strength	0.10
Carrizo, stable-----	25	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness Slope	1.00 0.50 0.50	Slight Strength	0.10
Carrizo, occasionally flooded, rocky surface-----	20	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
Russiroks-----	20	Moderately suited Rock fragments	0.50	Unsuited Rock fragments	1.00	Moderate Low strength	0.50
1541: Carrizo, stable-----	50	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness Slope	1.00 0.50 0.50	Slight Strength	0.10
Cambidic Haplodurids	40	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Slight Strength	0.10
1542: Carrizo, very rarely flooded-----	70	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness Slope	1.00 0.50 0.50	Slight Strength	0.10
Carrizo, occasionally flooded-----	20	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness Slope	0.75 0.50 0.50	Slight Strength	0.10

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1550: Buzzardsprings, stable-----	35	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
Coxpin-----	25	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
Dalelake-----	20	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
1555: Goldrose-----	35	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Sandiness Slope	0.50 0.50 0.50	Moderate Low strength	0.50
Carsitas, very rarely flooded----	30	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Sandiness Slope	0.50 0.50 0.50	Moderate Low strength	0.50
Chemwash, rarely flooded-----	25	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness Slope	0.75 0.50 0.50	Moderate Low strength	0.50
2003: Emptygun-----	100	Moderately suited Rock fragments	0.50	Unsuited Slope Rock fragments	1.00 0.75	Moderate Low strength	0.50
2060: Joetree, very rarely flooded----	35	Well suited		Well suited		Moderate Low strength	0.50
Dalelake-----	30	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Pintobasin, fine sandy loam-----	25	Well suited		Well suited		Moderate Low strength	0.50
2065: Dalelake-----	30	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Aquapeak-----	25	Moderately suited Rock fragments	0.50	Unsuited Rock fragments Slope	1.00 0.50	Slight Strength	0.10
Coxpin-----	25	Moderately suited Rock fragments	0.50	Moderately suited Rock fragments	0.50	Moderate Low strength	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2067:							
Aquapeak, overblown-	30	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
Buzzardsprings-----	25	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
Dalelake, thick sandy surface-----	20	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
Buzzardsprings, steep-----	15	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments Slope	0.75 0.50	Moderate Low strength	0.50
2068:							
Aquapeak-----	45	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
Carpetflat, nongravelly surface	35	Unsuited Restrictive layer	1.00	Moderately suited Restrictive layer Rock fragments	0.50 0.50	Moderate Low strength	0.50
Pintobasin-----	15	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
2070:							
Missionsweet-----	60	Poorly suited Rock fragments	0.75	Unsuited Rock fragments Slope	1.00 0.50	Moderate Low strength	0.50
Carpetflat-----	25	Poorly suited Rock fragments	0.75	Unsuited Rock fragments	1.00	Slight Strength	0.10
2075:							
Oldale-----	50	Moderately suited Rock fragments	0.50	Unsuited Rock fragments	1.00	Slight Strength	0.10
Missionsweet-----	30	Poorly suited Rock fragments	0.75	Unsuited Rock fragments Slope	1.00 0.50	Moderate Low strength	0.50
2076:							
Oldale-----	40	Poorly suited Rock fragments	0.75	Unsuited Rock fragments	1.00	Slight Strength	0.10
Carrizo-----	30	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
2077:							
Oldale-----	50	Moderately suited Rock fragments	0.50	Unsuited Rock fragments	1.00	Slight Strength	0.10
Carrizo-----	25	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part I (Planting)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2077: Carrizo, very rarely flooded-----	15	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Slight Strength	0.10
2085: Rainbowsend-----	45	Unsuited Rock fragments Sandiness Slope	1.00 0.50 0.50	Unsuited Rock fragments Slope Sandiness	1.00 1.00 0.50	Slight Strength	0.10
Goldenbell-----	35	Poorly suited Rock fragments Restrictive layer	0.75 0.50	Unsuited Rock fragments	1.00	Slight Strength	0.10
2090: Deprave-----	35	Moderately suited Rock fragments	0.50	Unsuited Rock fragments	1.00	Moderate Low strength	0.50
Rockhound-----	25	Moderately suited Rock fragments	0.50	Unsuited Rock fragments	1.00	Moderate Low strength	0.50
Rizzo-----	20	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
2091: Deprave-----	60	Moderately suited Rock fragments	0.50	Unsuited Rock fragments	1.00	Moderate Low strength	0.50
Roostertail-----	15	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50
2100: Perurose-----	50	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
Coxpin-----	25	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
Pintobasin, gravelly surface---	15	Poorly suited Rock fragments	0.75	Unsuited Rock fragments Slope	1.00 0.50	Moderate Low strength	0.50
2101: Perurose, rarely flooded-----	60	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
Pintobasin, rarely flooded-----	35	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2110:							
Descent-----	80	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Sandiness	0.50	Slope	1.00		
		Slope	0.50	Sandiness	0.50		
Descent, stable-----	15	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Sandiness	0.50	Sandiness	0.50		
2111:							
Descent, warm-----	45	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Sandiness	0.50	Slope	1.00		
		Slope	0.50	Sandiness	0.50		
Rubylee, very rarely flooded-----	40	Moderately suited		Poorly suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
				Slope	0.50		
2120:							
Rizzo, rarely flooded-----	35	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Rock fragments	1.00	Low strength	0.50
		Sandiness	0.50	Sandiness	0.50		
				Slope	0.50		
Deprave-----	35	Moderately suited		Unsuited		Moderate	
		Rock fragments	0.50	Rock fragments	1.00	Low strength	0.50
Rizzo, frequently flooded-----	20	Moderately suited		Poorly suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
		Sandiness	0.50	Sandiness	0.50		
2121:							
Rizzo, rubbly-----	90	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Rock fragments	1.00	Low strength	0.50
		Sandiness	0.50	Sandiness	0.50		
				Slope	0.50		
2130:							
Goldenbell-----	55	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Restrictive layer	0.50				
Descent-----	40	Moderately suited		Unsuited		Slight	
		Rock fragments	0.50	Rock fragments	1.00	Strength	0.10
		Sandiness	0.50	Sandiness	0.50		
				Slope	0.50		
2140:							
Rockhound, cobbly---	85	Moderately suited		Unsuited		Slight	
		Rock fragments	0.50	Rock fragments	1.00	Strength	0.10
				Slope	0.50		



# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2402: Rizzo-----	70	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness Slope	1.00 0.50 0.50	Moderate Low strength	0.50
Rizzo, frequently flooded-----	20	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
2403: Rizzo-----	80	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness Slope	1.00 0.50 0.50	Moderate Low strength	0.50
Rizzo, occasionally flooded-----	15	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
2404: Rizzo, occasionally flooded-----	60	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
Rizzo, very rarely flooded-----	35	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
2405: Carrizo, rarely flooded-----	65	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50
Carrizo, occasionally flooded-----	25	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
2406: Pintobasin, frequently flooded-	50	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
Carrizo, occasionally flooded-----	40	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2407: Pintobasin, rarely flooded-----	45	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
Carrizo, occasionally flooded-----	30	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
Carrizo, frequently flooded-----	20	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Slight Strength	0.10
2408: Rizzo, frequently flooded-----	55	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50
Rizzo, very rarely flooded-----	35	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
2409: Rizzo, frequently flooded-----	35	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
Chemwash, frequently flooded-	30	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50
Carsitas, occasionally flooded, braided---	25	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
2420: Carsitas, frequently flooded-	45	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
Carsitas, occasionally flooded-----	40	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
Carsitas, rarely flooded-----	15	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting	Value	Suitability for mechanical planting	Value	Soil rutting hazard	
		Rating class and limiting features		Rating class and limiting features		Rating class and limiting features	Value
2421: Carsitas, very rarely flooded-----	55	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderately suited Rock fragments Sandiness Slope	0.50 0.50 0.50	Moderate Low strength	0.50
Carsitas, rarely flooded-----	25	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope Rock fragments	0.50 0.50 0.50	Moderate Low strength	0.50
2431: Chemwash, frequently flooded, braided---	60	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness Slope	0.75 0.50 0.50	Moderate Low strength	0.50
Chemwash, frequently flooded-	25	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness Slope	0.75 0.50 0.50	Moderate Low strength	0.50
2440: Rizzo-----	35	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Slope Sandiness	1.00 0.50 0.50	Moderate Low strength	0.50
Rizzo, occasionally flooded-----	30	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Slope Sandiness	1.00 0.50 0.50	Moderate Low strength	0.50
Rizzo, extremely stony-----	15	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Slope Sandiness	1.00 0.50 0.50	Moderate Low strength	0.50
2715: Dalelake-----	35	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
Sheephole-----	30	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Pintobasin-----	25	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting	Value	Suitability for mechanical planting	Value	Soil rutting hazard	
		Rating class and limiting features		Rating class and limiting features		Rating class and limiting features	Value
2716:							
Dalelake, steep-----	75	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
Dalelake-----	20	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
2717:							
Dalelake-----	40	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Poorly suited Rock fragments	0.75	Unsuited Rock fragments	1.00	Moderate Low strength	0.50
2718:							
Dalelake-----	55	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Sheephole, gravelly surface-----	45	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
2820:							
Rock outcrop-----	60	Not rated		Not rated		Not rated	
Impedimenta-----	25	Unsuited Restrictive layer Sandiness	1.00 0.50	Poorly suited Slope Rock fragments Restrictive layer Sandiness	0.75 0.50 0.50 0.50	Moderate Low strength	0.50
2825:							
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Supplymine-----	25	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Slope Rock fragments Sandiness	1.00 1.00 0.50	Slight Strength	0.10
Bolero, dry-----	15	Poorly suited Rock fragments Sandiness Slope	0.75 0.50 0.50	Unsuited Rock fragments Slope Sandiness	1.00 1.00 0.50	Slight Strength	0.10
Ironage-----	15	Unsuited Rock fragments Sandiness Slope	1.00 0.50 0.50	Unsuited Rock fragments Slope Sandiness	1.00 1.00 0.50	Slight Strength	0.10
2830:							
Rock outcrop-----	80	Not rated		Not rated		Not rated	
Blackeagle, cool----	10	Unsuited Rock fragments Sandiness Slope	1.00 0.50 0.50	Unsuited Slope Rock fragments Sandiness	1.00 1.00 0.50	Slight Strength	0.10

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part I (Planting)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2835:							
Rock outcrop-----	40	Not rated		Not rated		Not rated	
Blackeagle-----	40	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Sandiness	0.50	Rock fragments	1.00		
		Slope	0.50	Sandiness	0.50		
2840:							
Rock outcrop-----	65	Not rated		Not rated		Not rated	
Jadestorm-----	30	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Restrictive layer	0.50	Rock fragments	1.00		
		Sandiness	0.50	Sandiness	0.50		
		Slope	0.50				
3110:							
Coppermine, cool----	40	Unsuited		Unsuited		Moderate	
		Restrictive layer	1.00	Rock fragments	1.00	Low strength	0.50
		Rock fragments	0.75	Slope	0.75		
				Restrictive layer	0.50		
Stranger-----	30	Unsuited		Unsuited		Moderate	
		Restrictive layer	1.00	Restrictive layer	1.00	Low strength	0.50
		Sandiness	0.50	Slope	0.50		
				Sandiness	0.50		
3120:							
Aguilareal-----	40	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Sandiness	0.50	Rock fragments	1.00		
		Slope	0.50	Sandiness	0.50		
Blackeagle-----	20	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Sandiness	0.50	Rock fragments	1.00		
		Slope	0.50	Sandiness	0.50		
Rock outcrop-----	15	Not rated		Not rated		Not rated	
3213:							
Dalvord-----	35	Moderately suited		Unsuited		Slight	
		Rock fragments	0.50	Rock fragments	1.00	Strength	0.10
		Sandiness	0.50	Slope	0.75		
				Sandiness	0.50		
Aguilareal-----	30	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Sandiness	0.50	Rock fragments	1.00		
		Slope	0.50	Sandiness	0.50		
Rock outcrop-----	25	Not rated		Not rated		Not rated	
3242:							
Langwell-----	50	Unsuited		Poorly suited		Moderate	
		Restrictive layer	1.00	Slope	0.75	Low strength	0.50
				Rock fragments	0.50		
				Restrictive layer	0.50		

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3242: Rock outcrop-----	25	Not rated		Not rated		Not rated	
Helendale, cool-----	20	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
3285: Pinecity-----	30	Poorly suited Restrictive layer Rock fragments Slope	0.75 0.50 0.50	Unsuited Slope Rock fragments	1.00 0.75	Moderate Low strength	0.50
Contactmine-----	20	Moderately suited Rock fragments	0.50	Unsuited Slope Rock fragments	1.00 0.75	Moderate Low strength	0.50
Desertqueen-----	20	Poorly suited Rock fragments Restrictive layer	0.75 0.50	Unsuited Rock fragments Slope	1.00 0.75	Moderate Low strength	0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	
3286: Pinecity, gravelly loamy sand-----	85	Unsuited Rock fragments Restrictive layer Slope	1.00 0.75 0.50	Unsuited Slope Rock fragments	1.00 1.00	Moderate Low strength	0.50
3291: Smithcanyon-----	40	Poorly suited Restrictive layer Rock fragments	0.75 0.50	Poorly suited Rock fragments Slope	0.75 0.75	Moderate Low strength	0.50
Stubbespring-----	25	Poorly suited Rock fragments Slope	0.75 0.50	Unsuited Rock fragments Slope	1.00 1.00	Moderate Low strength	0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3292: Smithcanyon-----	35	Poorly suited Restrictive layer Rock fragments	0.75 0.50	Poorly suited Slope Rock fragments	0.75 0.75	Moderate Low strength	0.50
Pinecity-----	25	Poorly suited Restrictive layer Rock fragments Slope	0.75 0.50 0.50	Unsuited Slope Rock fragments	1.00 0.75	Moderate Low strength	0.50
Rock outcrop-----	25	Not rated		Not rated		Not rated	
3293: Smithcanyon-----	50	Poorly suited Restrictive layer Rock fragments Sandiness Slope	0.75 0.50 0.50 0.50	Unsuited Slope Rock fragments Sandiness	1.00 0.75 0.50	Moderate Low strength	0.50
Pinecity-----	25	Poorly suited Restrictive layer Rock fragments Slope	0.75 0.50 0.50	Unsuited Slope Rock fragments	1.00 0.75	Moderate Low strength	0.50



# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting	Value	Suitability for mechanical planting	Value	Soil rutting hazard	
		Rating class and limiting features		Rating class and limiting features		Rating class and limiting features	Value
3294: Smithcanyon, dry----	80	Moderately suited Restrictive layer Sandiness Slope	 0.50 0.50 0.50	Unsuited Slope Rock fragments Sandiness	 1.00 0.50 0.50	Moderate Low strength	 0.50
3295: Desertqueen, dry----	40	Poorly suited Rock fragments Restrictive layer	 0.75 0.50	Unsuited Rock fragments Slope	 1.00 0.75	Moderate Low strength	 0.50
Hexie-----	20	Moderately suited Rock fragments Slope	 0.50 0.50	Unsuited Rock fragments Slope	 1.00 1.00	Moderate Low strength	 0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3296: Desertqueen-----	45	Poorly suited Rock fragments	 0.75	Unsuited Rock fragments Slope	 1.00 0.75	Moderate Low strength	 0.50
Pinecity-----	35	Poorly suited Restrictive layer Rock fragments Sandiness	 0.75 0.50 0.50	Poorly suited Slope Rock fragments Sandiness	 0.75 0.75 0.50	Moderate Low strength	 0.50
3297: Desertqueen, warm---	40	Poorly suited Restrictive layer Rock fragments	 0.75 0.75	Unsuited Rock fragments Slope	 1.00 0.75	Moderate Low strength	 0.50
Contactmine, dry----	20	Poorly suited Rock fragments Stickiness; high plasticity index	 0.75 0.50	Unsuited Rock fragments Slope Stickiness; high plasticity index	 1.00 0.75 0.50	Moderate Low strength	 0.50
Seanna, dry-----	20	Moderately suited Rock fragments	 0.50	Unsuited Slope Rock fragments	 1.00 0.75	Moderate Low strength	 0.50
3325: Ironped, warm-----	30	Poorly suited Restrictive layer Sandiness Rock fragments	 0.75 0.50 0.50	Unsuited Slope Rock fragments Sandiness	 1.00 0.75 0.50	Moderate Low strength	 0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Hexie-----	15	Moderately suited Rock fragments Slope	 0.50 0.50	Unsuited Slope Rock fragments	 1.00 0.75	Moderate Low strength	 0.50
Ironped-----	15	Poorly suited Restrictive layer Sandiness Slope Rock fragments	 0.75 0.50 0.50 0.50	Unsuited Slope Rock fragments Sandiness	 1.00 0.75 0.50	Moderate Low strength	 0.50

Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part I (Planting)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3335:							
Xeric Torriorthents-	40	Moderately suited		Unsuited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
				Rock fragments	0.50		
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Xeric							
Torriorthents, warm	25	Moderately suited		Unsuited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
				Rock fragments	0.50		
3336:							
Xeric Torriorthents-	45	Moderately suited		Unsuited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
				Rock fragments	0.50		
Bigbernie-----	25	Moderately suited		Unsuited		Moderate	
		Rock fragments	0.50	Slope	1.00	Low strength	0.50
		Sandiness	0.50	Rock fragments	0.75		
		Slope	0.50	Sandiness	0.50		
3340:							
Seanna-----	35	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Slope	1.00	Low strength	0.50
		Slope	0.50	Rock fragments	1.00		
Grubstake, moist----	20	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Slope	1.00	Strength	0.10
		Slope	0.50	Rock fragments	1.00		
Pinecity-----	15	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Slope	1.00	Low strength	0.50
		Slope	0.50	Rock fragments	1.00		
		Restrictive layer	0.50				
3345:							
Bigcanyon-----	55	Moderately suited		Unsuited		Moderate	
		Sandiness	0.50	Slope	1.00	Low strength	0.50
		Slope	0.50	Rock fragments	0.75		
		Rock fragments	0.50	Sandiness	0.50		
Bigcanyon, cool-----	20	Moderately suited		Unsuited		Moderate	
		Sandiness	0.50	Slope	1.00	Low strength	0.50
		Slope	0.50	Rock fragments	0.50		
		Rock fragments	0.50	Sandiness	0.50		
3440:							
Pacific Mesa, steep-	65	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Rock fragments	1.00	Low strength	0.50
		Slope	0.50	Slope	1.00		
Pacific Mesa-----	30	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
				Slope	0.50		
3509:							
Cajon, very rarely flooded-----	60	Well suited		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
Smithcanyon-----	20	Moderately suited		Moderately suited		Moderate	
		Sandiness	0.50	Rock fragments	0.50	Low strength	0.50
		Rock fragments	0.50	Sandiness	0.50		

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3525: Cajon-----	70	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
Smithcanyon-----	15	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
3526: Cajon-----	40	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
Hypoint-----	35	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
Arizo, occasionally flooded-----	15	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50
3611: Burntshack, sand surface-----	50	Well suited		Well suited		Moderate Low strength	0.50
Burntshack-----	35	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
3612: Burntshack-----	75	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
Burntshack, occasionally flooded-----	20	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50
3676: Morongo, loamy sand, very rarely flooded-----	80	Well suited		Well suited		Moderate Low strength	0.50
3677: Morongo-----	80	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
3679: Morongo, cool-----	55	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Jumborox-----	20	Well suited		Well suited		Moderate Low strength	0.50
3680: Morongo-----	85	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3681: Morongo, very rarely flooded-----	45	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Jumborox, dry-----	35	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
3682: Morongo, cool-----	50	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Jumborox-----	15	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Urban land-----	15	Not rated		Not rated		Not rated	
3683: Morongo-----	55	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness Slope	0.75 0.50 0.50	Moderate Low strength	0.50
Bluecut, very rarely flooded-----	30	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
3684: Morongo, warm-----	85	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope Rock fragments	0.50 0.50 0.50	Moderate Low strength	0.50
3685: Morongo, cool-----	65	Moderately suited Sandiness	0.50	Moderately suited Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
Desertqueen, undulating-----	15	Well suited		Unsuited Slope Rock fragments	1.00 0.50	Moderate Low strength	0.50
3690: Nasagold-----	85	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
3695: Gocougs-----	80	Well suited		Well suited		Moderate Low strength	0.50
4031: Crosgrain-----	50	Moderately suited Rock fragments	0.50	Poorly suited Slope Rock fragments	0.75 0.75	Slight Strength	0.10
Crackerjack-----	30	Moderately suited Rock fragments	0.50	Poorly suited Slope Rock fragments	0.75 0.75	Slight Strength	0.10
Pinkcan, dry-----	15	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments Slope	0.75 0.50	Moderate Low strength	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4041: Silvermine-----	40	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Helendale-----	30	Well suited		Well suited		Moderate Low strength	0.50
Burntshack, very rarely flooded-----	20	Well suited		Well suited		Moderate Low strength	0.50
4064: Gravesumit-----	55	Well suited		Well suited		Moderate Low strength	0.50
Helendale, sandy surface-----	35	Well suited		Well suited		Moderate Low strength	0.50
4071: Helendale-----	65	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments Slope	0.75 0.50	Moderate Low strength	0.50
Desertqueen, very rarely flooded-----	15	Moderately suited Rock fragments	0.50	Unsuited Rock fragments Slope	1.00 0.50	Moderate Low strength	0.50
4091: Littlefargo-----	85	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
4245: Bluecut-----	40	Well suited		Moderately suited Rock fragments Slope	0.50 0.50	Moderate Low strength	0.50
Morongo, very rarely flooded-----	25	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
Yander, very rarely flooded-----	15	Well suited		Moderately suited Rock fragments	0.50	Moderate Low strength	0.50
4260: Minhoyt-----	45	Unsuited Restrictive layer Rock fragments	1.00 0.50	Poorly suited Rock fragments Restrictive layer	0.75 0.50	Moderate Low strength	0.50
Corbilt, rarely flooded-----	40	Moderately suited Sandiness	0.50	Moderately suited Sandiness	0.50	Moderate Low strength	0.50
4265: Werewolf, warm-----	80	Poorly suited Rock fragments	0.75	Unsuited Rock fragments Slope	1.00 0.50	Moderate Low strength	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting	Value	Suitability for mechanical planting	Value	Soil rutting hazard	
		Rating class and limiting features		Rating class and limiting features		Rating class and limiting features	Value
4270: Yuccabutte, extremely cobbly sandy loam-----	95	Poorly suited Rock fragments Stickiness; high plasticity index	0.75 0.50	Unsuited Rock fragments Slope Stickiness; high plasticity index	1.00 0.75 0.50	Slight Strength	0.10
4271: Yuccabutte, warm----	60	Moderately suited Rock fragments Stickiness; high plasticity index	0.50 0.50	Poorly suited Rock fragments Slope Stickiness; high plasticity index	0.75 0.50 0.50	Severe Low strength	1.00
Arizo, rarely flooded-----	30	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments Slope	0.75 0.50	Moderate Low strength	0.50
4275: Pinkcan-----	35	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments	0.75	Moderate Low strength	0.50
Werewolf-----	25	Well suited		Well suited		Moderate Low strength	0.50
Gocougs, warm-----	15	Moderately suited Stickiness; high plasticity index Rock fragments	0.50 0.50	Moderately suited Rock fragments Stickiness; high plasticity index	0.50 0.50	Severe Low strength	1.00
4280: Mekkadale-----	55	Moderately suited Rock fragments	0.50	Poorly suited Slope Rock fragments	0.75 0.75	Severe Low strength	1.00
Edalph, warm-----	25	Well suited		Unsuited Slope Rock fragments	1.00 0.50	Moderate Low strength	0.50
4285: Typic Argidurids----	35	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments Slope	0.75 0.75	Moderate Low strength	0.50
Coppermine-----	30	Unsuited Restrictive layer Rock fragments	1.00 0.50	Poorly suited Slope Rock fragments Restrictive layer	0.75 0.75 0.50	Moderate Low strength	0.50
Minhoyt, warm-----	25	Unsuited Restrictive layer Rock fragments	1.00 0.50	Poorly suited Rock fragments Restrictive layer Slope	0.75 0.50 0.50	Severe Low strength	1.00



# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part I (Planting)--Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4403: Arizo, rarely flooded, channeled-	50	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
Arizo, rarely flooded-----	25	Poorly suited Rock fragments Sandiness	0.75 0.50	Unsuited Rock fragments Sandiness	1.00 0.50	Moderate Low strength	0.50
Arizo-----	20	Moderately suited Rock fragments Sandiness	0.50 0.50	Poorly suited Rock fragments Sandiness Slope	0.75 0.50 0.50	Moderate Low strength	0.50
4440: Dragonwash, occasionally flooded-----	55	Moderately suited Sandiness	0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
Dragonwash, frequently flooded-	35	Moderately suited Sandiness Rock fragments	0.50 0.50	Poorly suited Rock fragments Sandiness	0.75 0.50	Moderate Low strength	0.50
4450: Morongo, occasionally flooded-----	75	Moderately suited Sandiness	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderate Low strength	0.50
Morongo, frequently flooded-----	15	Moderately suited Sandiness Rock fragments	0.50 0.50	Moderately suited Rock fragments Sandiness	0.50 0.50	Moderate Low strength	0.50
4605: Pinecity, moist----	80	Moderately suited Restrictive layer	0.50	Moderately suited Slope	0.50	Moderate Low strength	0.50
4606: Pinecity-----	60	Poorly suited Restrictive layer Rock fragments	0.75 0.50	Poorly suited Rock fragments Slope	0.75 0.50	Moderate Low strength	0.50
Rock outcrop-----	25	Not rated		Not rated		Not rated	
4607: Pinecity-----	85	Poorly suited Restrictive layer Rock fragments Sandiness	0.75 0.50 0.50	Poorly suited Rock fragments Sandiness Slope	0.75 0.50 0.50	Moderate Low strength	0.50
4608: Pinecity-----	60	Poorly suited Restrictive layer Rock fragments	0.75 0.50	Poorly suited Rock fragments Slope	0.75 0.50	Moderate Low strength	0.50
Rock outcrop-----	30	Not rated		Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting	Value	Suitability for mechanical planting	Value	Soil rutting hazard	
		Rating class and limiting features		Rating class and limiting features		Rating class and limiting features	Value
4610: Desertqueen-----	35	Moderately suited Rock fragments	0.50	Unsuited Rock fragments Slope	1.00 0.50	Moderate Low strength	0.50
Jumborox, warm-----	25	Well suited		Moderately suited Slope	0.50	Moderate Low strength	0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
4615: Desertqueen, cool---	45	Moderately suited Rock fragments	0.50	Poorly suited Slope Rock fragments	0.75 0.75	Moderate Low strength	0.50
Jumborox-----	25	Well suited		Well suited		Moderate Low strength	0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	
4620: Stranger-----	40	Unsuited Restrictive layer Sandiness Slope	1.00 0.50 0.50	Unsuited Restrictive layer Slope Sandiness	1.00 1.00 0.50	Moderate Low strength	0.50
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Grubstake, moist-----	20	Well suited		Moderately suited Slope Rock fragments	0.50 0.50	Moderate Low strength	0.50
4625: Grinder-----	50	Unsuited Restrictive layer Rock fragments	1.00 0.50	Moderately suited Slope Rock fragments Restrictive layer	0.50 0.50 0.50	Moderate Low strength	0.50
Grinder, cool-----	20	Unsuited Restrictive layer Rock fragments	1.00 0.50	Poorly suited Slope Rock fragments Restrictive layer	0.75 0.50 0.50	Moderate Low strength	0.50
Pinkcan, cool-----	15	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments Slope	0.75 0.50	Moderate Low strength	0.50
4630: Thunderclap-----	50	Moderately suited Sandiness	0.50	Moderately suited Sandiness Slope	0.50 0.50	Moderate Low strength	0.50
Smithcanyon-----	30	Moderately suited Rock fragments	0.50	Poorly suited Rock fragments Slope	0.75 0.50	Moderate Low strength	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4804:							
Rock outcrop-----	45	Not rated		Not rated		Not rated	
Ironped-----	25	Poorly suited		Unsuited		Moderate	
		Restrictive layer	0.75	Slope	1.00	Low strength	0.50
		Slope	0.50	Rock fragments	0.75		
		Rock fragments	0.50				
Pinecity-----	20	Poorly suited		Unsuited		Moderate	
		Restrictive layer	0.75	Slope	1.00	Low strength	0.50
		Rock fragments	0.75	Rock fragments	1.00		
		Slope	0.50				
4805:							
Rock outcrop-----	50	Not rated		Not rated		Not rated	
Ironped-----	25	Poorly suited		Unsuited		Moderate	
		Restrictive layer	0.75	Rock fragments	1.00	Low strength	0.50
		Rock fragments	0.75	Slope	0.50		
4806:							
Rock outcrop-----	90	Not rated		Not rated		Not rated	
4811:							
Rock outcrop-----	85	Not rated		Not rated		Not rated	
Pioneertown-----	10	Unsuited		Unsuited		Moderate	
		Restrictive layer	1.00	Slope	1.00	Low strength	0.50
		Sandiness	0.50	Rock fragments	0.50		
		Slope	0.50	Sandiness	0.50		
				Restrictive layer	0.50		
4825:							
Rock outcrop-----	30	Not rated		Not rated		Not rated	
Grubstake-----	20	Well suited		Moderately suited		Moderate	
				Rock fragments	0.50	Low strength	0.50
Cajon, rarely flooded-----	20	Well suited		Well suited		Moderate	
						Low strength	0.50
Stranger, warm-----	15	Unsuited		Unsuited		Moderate	
		Restrictive layer	1.00	Restrictive layer	1.00	Low strength	0.50
		Sandiness	0.50	Sandiness	0.50		
4830:							
Rock outcrop-----	80	Not rated		Not rated		Not rated	
Pinecity, cool-----	10	Unsuited		Unsuited		Moderate	
		Rock fragments	1.00	Rock fragments	1.00	Low strength	0.50
		Restrictive layer	0.75	Slope	0.50		
4900:							
Rock outcrop-----	65	Not rated		Not rated		Not rated	
Aguilareal-----	15	Poorly suited		Unsuited		Slight	
		Rock fragments	0.75	Rock fragments	1.00	Strength	0.10
		Sandiness	0.50	Slope	1.00		
		Slope	0.50	Sandiness	0.50		

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part I (Planting)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting	Value	Suitability for mechanical planting	Value	Soil rutting hazard	
		Rating class and limiting features		Rating class and limiting features		Rating class and limiting features	Value
4900: Lostpalms-----	15	Unsuited		Unsuited		Slight	
		Restrictive layer	1.00	Rock fragments	1.00	Strength	0.10
		Rock fragments	0.75	Slope	1.00		
		Slope	0.50	Restrictive layer	0.50		

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1220:							
Jadestorm-----	60	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Rock fragments	1.00 0.50 0.50
Blackeagle, cool----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1225:							
Blackeagle-----	65	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1230:							
Jadestorm-----	45	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Jadestorm, cool----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1240:							
Meccapass-----	45	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Bulletproof-----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1241:							
Meccapass-----	45	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Seanna-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Contactmine, dry----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1242:							
Meccapass-----	40	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Jadestorm-----	25	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1250:							
Ironlung-----	50	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Ironlung, cool-----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Rock fragments	1.00 0.50 0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1255:							
Goldenhills-----	40	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Bulletproof-----	15	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Fanhill-----	15	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Whiterobe-----	15	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Rock fragments	1.00 0.50 0.50
1260:							
Whiterobe-----	45	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Bigbernie-----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Whiterobe, cool-----	15	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50



# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1410:							
Missionwell-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Missionwell, high elevation-----	15	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
1415:							
Bolero-----	60	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
1504:							
Rizzo, rarely flooded, stony-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Rock fragments	0.50 0.50
Rizzo, occasionally flooded, stony-----	35	Slight		Moderate Slope/erodibility	0.50	Poorly suited Flooding Slope Sandiness Rock fragments	1.00 0.50 0.50 0.50
1510:							
Carrizo, very gravelly sandy loam	85	Slight		Slight		Moderately suited Sandiness	0.50
1511:							
Carrizo, channeled--	75	Slight		Slight		Moderately suited Sandiness	0.50
Carrizo, occasionally flooded-----	15	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
1512:							
Carrizo, extremely gravelly sandy loam	80	Slight		Slight		Moderately suited Sandiness Rock fragments	0.50 0.50
1513:							
Carrizo-----	60	Slight		Slight		Well suited	
Carrizo, occasionally flooded, channeled-	20	Slight		Slight		Poorly suited Flooding Rock fragments Sandiness	1.00 0.50 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1513: Rubylee-----	15	Slight		Slight		Moderately suited Rock fragments	0.50
1514: Carrizo, rarely flooded-----	40	Slight		Slight		Moderately suited Sandiness	0.50
Pintobasin, fine sandy loam-----	30	Slight		Slight		Well suited	
Rubylee-----	15	Slight		Slight		Moderately suited Rock fragments	0.50
1515: Pintobasin-----	80	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness	0.50
Carrizo, occasionally flooded-----	15	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
1516: Pintobasin, fine sandy loam-----	90	Slight		Slight		Well suited	
1517: Pintobasin-----	65	Slight		Slight		Moderately suited Sandiness	0.50
Dalelake-----	25	Slight		Slight		Moderately suited Sandiness	0.50
1520: Pintobasin, loamy sand-----	80	Slight		Moderate Slope/erodibility	0.50	Well suited	
1522: Pintobasin, rarely flooded-----	85	Slight		Slight		Moderately suited Sandiness	0.50
1523: Pintobasin, rarely flooded-----	50	Slight		Slight		Moderately suited Sandiness	0.50
Aquapeak-----	25	Slight		Slight		Well suited	
Pintobasin, occasionally flooded-----	20	Slight		Slight		Moderately suited Sandiness Flooding	0.50 0.50
1524: Pintobasin, rarely flooded-----	90	Slight		Slight		Moderately suited Sandiness	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1525: Pintobasin, occasionally flooded-----	45	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
Pintobasin, rarely flooded-----	35	Slight		Moderate Slope/erodibility	0.50	Well suited	
1526: Pintobasin, rarely flooded-----	55	Slight		Moderate Slope/erodibility	0.50	Well suited	
Joetree-----	20	Slight		Slight		Well suited	
Patscamp-----	15	Slight		Slight		Moderately suited Sandiness	0.50
1527: Pintobasin, moist---	90	Slight		Severe Slope/erodibility	0.95	Moderately suited Slope	0.50
1530: Dalelake, fine sand-	85	Slight		Slight		Moderately suited Sandiness	0.50
1531: Dalelake-----	60	Slight		Slight		Moderately suited Sandiness	0.50
Pintobasin, rarely flooded-----	30	Slight		Slight		Moderately suited Sandiness	0.50
1540: Carrizo, very rarely flooded----	35	Slight		Slight		Moderately suited Rock fragments Sandiness	0.50 0.50
Carrizo, stable----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Rock fragments	0.50
Carrizo, occasionally flooded, rocky surface-----	20	Slight		Slight		Poorly suited Flooding Rock fragments Sandiness	1.00 0.50 0.50
Russiroks-----	20	Slight		Slight		Well suited	
1541: Carrizo, stable----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Rock fragments	0.50 0.50
Cambidic Haplodurids	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Rock fragments	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1542:							
Carrizo, very rarely flooded-----	70	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Rock fragments Sandiness	0.50 0.50 0.50
Carrizo, occasionally flooded-----	20	Slight		Moderate Slope/erodibility	0.50	Poorly suited Flooding Rock fragments Sandiness Slope	1.00 0.50 0.50 0.50
1550:							
Buzzardsprings, stable-----	35	Slight		Slight		Well suited	
Coxpin-----	25	Slight		Moderate Slope/erodibility	0.50	Well suited	
Dalelake-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness	0.50
1555:							
Goldrose-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness	0.50
Carsitas, very rarely flooded-----	30	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Slope	0.50 0.50
Chemwash, rarely flooded-----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Slope	0.50 0.50
2003:							
Emptygun-----	100	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
2060:							
Joetree, very rarely flooded-----	35	Slight		Slight		Well suited	
Dalelake-----	30	Slight		Slight		Moderately suited Sandiness	0.50
Pintobasin, fine sandy loam-----	25	Slight		Slight		Well suited	
2065:							
Dalelake-----	30	Slight		Slight		Moderately suited Sandiness	0.50
Aquapeak-----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Coxpin-----	25	Slight		Slight		Well suited	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2067:							
Aquapeak, overblown-	30	Slight		Slight		Well suited	
Buzzardsprings-----	25	Slight		Moderate Slope/erodibility	0.50	Well suited	
Dalelake, thick sandy surface-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Buzzardsprings, steep-----	15	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
2068:							
Aquapeak-----	45	Slight		Slight		Well suited	
Carpetflat, nongravelly surface	35	Slight		Slight		Well suited	
Pintobasin-----	15	Slight		Slight		Moderately suited Sandiness	0.50
2070:							
Missionsweet-----	60	Slight		Moderate Slope/erodibility	0.50	Poorly suited Slope Rock fragments	1.00 0.50
Carpetflat-----	25	Slight		Slight		Moderately suited Rock fragments	0.50
2075:							
Olddale-----	50	Slight		Slight		Moderately suited Low strength Rock fragments	0.50 0.50
Missionsweet-----	30	Slight		Moderate Slope/erodibility	0.50	Poorly suited Slope Rock fragments	1.00 0.50
2076:							
Olddale-----	40	Slight		Slight		Moderately suited Rock fragments	0.50
Carrizo-----	30	Slight		Slight		Moderately suited Sandiness	0.50
2077:							
Olddale-----	50	Slight		Slight		Moderately suited Rock fragments Low strength	0.50 0.50
Carrizo-----	25	Slight		Slight		Moderately suited Rock fragments	0.50
Carrizo, very rarely flooded-----	15	Slight		Slight		Moderately suited Rock fragments Sandiness	0.50 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2085:							
Rainbowsend-----	45	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50
Goldenbell-----	35	Slight		Slight		Moderately suited Sandiness Rock fragments	0.50 0.50
2090:							
Deprave-----	35	Slight		Slight		Well suited	
Rockhound-----	25	Slight		Slight		Well suited	
Rizzo-----	20	Slight		Slight		Moderately suited Sandiness Rock fragments	0.50 0.50
2091:							
Deprave-----	60	Slight		Slight		Well suited	
Roostertail-----	15	Slight		Slight		Moderately suited Sandiness	0.50
2100:							
Perurose-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Rock fragments	0.50
Coxpin-----	25	Slight		Moderate Slope/erodibility	0.50	Well suited	
Pintobasin, gravelly surface---	15	Slight		Moderate Slope/erodibility	0.50	Moderately suited Rock fragments	0.50
2101:							
Perurose, rarely flooded-----	60	Slight		Slight		Moderately suited Rock fragments	0.50
Pintobasin, rarely flooded-----	35	Slight		Slight		Moderately suited Sandiness	0.50
2110:							
Descent-----	80	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Descent, stable-----	15	Slight		Slight		Moderately suited Sandiness	0.50
2111:							
Descent, warm-----	45	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Rubylee, very rarely flooded-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Rock fragments	0.50 0.50



# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2120: Rizzo, rarely flooded-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited Rock fragments	0.50
Deprave-----	35	Slight		Slight		Well suited	
Rizzo, frequently flooded-----	20	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
2121: Rizzo, rubbly-----	90	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Rock fragments Sandiness	0.50 0.50 0.50
2130: Goldenbell-----	55	Slight		Slight		Well suited	
Descent-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
2140: Rockhound, cobbly---	85	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
2402: Rizzo-----	70	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Rock fragments	0.50 0.50
Rizzo, frequently flooded-----	20	Slight		Slight		Poorly suited Flooding Sandiness Rock fragments	1.00 0.50 0.50
2403: Rizzo-----	80	Slight		Moderate Slope/erodibility	0.50	Moderately suited Rock fragments	0.50
Rizzo, occasionally flooded-----	15	Slight		Slight		Poorly suited Flooding Rock fragments Sandiness	1.00 0.50 0.50
2404: Rizzo, occasionally flooded-----	60	Slight		Slight		Poorly suited Flooding Sandiness Rock fragments	1.00 0.50 0.50
Rizzo, very rarely flooded-----	35	Slight		Slight		Moderately suited Rock fragments	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2405:							
Carrizo, rarely flooded-----	65	Slight		Slight		Moderately suited Sandiness	0.50
Carrizo, occasionally flooded-----	25	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
2406:							
Pintobasin, frequently flooded-	50	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
Carrizo, occasionally flooded-----	40	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
2407:							
Pintobasin, rarely flooded-----	45	Slight		Slight		Moderately suited Sandiness	0.50
Carrizo, occasionally flooded-----	30	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
Carrizo, frequently flooded-----	20	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
2408:							
Rizzo, frequently flooded-----	55	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
Rizzo, very rarely flooded-----	35	Slight		Slight		Moderately suited Sandiness Rock fragments	0.50 0.50
2409:							
Rizzo, frequently flooded-----	35	Slight		Slight		Poorly suited Flooding Rock fragments Sandiness	1.00 0.50 0.50
Chemwash, frequently flooded-	30	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2409: Carsitas, occasionally flooded, braided---	25	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
2420: Carsitas, frequently flooded-	45	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
Carsitas, occasionally flooded-----	40	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
Carsitas, rarely flooded-----	15	Slight		Slight		Moderately suited Sandiness	0.50
2421: Carsitas, very rarely flooded----	55	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness	0.50
Carsitas, rarely flooded-----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Slope	0.50 0.50
2431: Chemwash, frequently flooded, braided---	60	Slight		Moderate Slope/erodibility	0.50	Poorly suited Flooding Sandiness	1.00 0.50
Chemwash, frequently flooded-	25	Slight		Moderate Slope/erodibility	0.50	Poorly suited Flooding Sandiness Slope	1.00 0.50 0.50
2440: Rizzo-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness Rock fragments	0.50 0.50 0.50
Rizzo, occasionally flooded-----	30	Slight		Moderate Slope/erodibility	0.50	Poorly suited Flooding Slope Sandiness Rock fragments	1.00 0.50 0.50 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2440: Rizzo, extremely stony-----	15	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness Rock fragments	0.50 0.50 0.50
2715: Dalelake-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Slope	0.50 0.50
Sheephole-----	30	Slight		Slight		Moderately suited Sandiness	0.50
Pintobasin-----	25	Slight		Slight		Moderately suited Sandiness	0.50
2716: Dalelake, steep----	75	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Dalelake-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Slope	0.50 0.50
2717: Dalelake-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Slight		Moderate Slope/erodibility	0.50	Moderately suited Rock fragments	0.50
2718: Dalelake-----	55	Slight		Slight		Moderately suited Sandiness	0.50
Sheephole, gravelly surface-----	45	Slight		Slight		Moderately suited Sandiness	0.50
2820: Rock outcrop-----	60	Not rated		Not rated		Not rated	
Impedimenta-----	25	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
2825: Rock outcrop-----	35	Not rated		Not rated		Not rated	
Supplymine-----	25	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2825: Bolero, dry-----	15	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50
Ironage-----	15	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50
2830: Rock outcrop-----	80	Not rated		Not rated		Not rated	
Blackeagle, cool----	10	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50
2835: Rock outcrop-----	40	Not rated		Not rated		Not rated	
Blackeagle-----	40	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
2840: Rock outcrop-----	65	Not rated		Not rated		Not rated	
Jadestorm-----	30	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50
3110: Coppermine, cool----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Stranger-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
3120: Aguilareal-----	40	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50
Blackeagle-----	20	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3213:							
Dalvord-----	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Aguilareal-----	30	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50
Rock outcrop-----	25	Not rated		Not rated		Not rated	
3242:							
Langwell-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Helendale, cool-----	20	Slight		Moderate Slope/erodibility	0.50	Well suited	
3285:							
Pinecity-----	30	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Contactmine-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Desertqueen-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
3286:							
Pinecity, gravelly loamy sand-----	85	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 1.00
3291:							
Smithcanyon-----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Stubbespring-----	25	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3292:							
Smithcanyon-----	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Pinecity-----	25	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Rock outcrop-----	25	Not rated		Not rated		Not rated	



# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3293: Smithcanyon-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Pinecity-----	25	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
3294: Smithcanyon, dry----	80	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
3295: Desertqueen, dry----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Hexie-----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3296: Desertqueen-----	45	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 1.00
Pinecity-----	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
3297: Desertqueen, warm----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Contactmine, dry----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Seanna, dry-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
3325: Ironped, warm-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Rock fragments	1.00 0.50 0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Hexie-----	15	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Ironped-----	15	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3335: Xeric Torriorthents, warm	40	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Xeric Torriorthents-	25	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
3336: Xeric Torriorthents-	45	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Bigbernie-----	25	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
3340: Seanna-----	35	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Grubstake, moist----	20	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Pinecity-----	15	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
3345: Bigcanyon-----	55	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Bigcanyon, cool----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
3440: Pacific Mesa, steep-	65	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 1.00
Pacific Mesa-----	30	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Rock fragments	0.50 0.50
3509: Cajon, very rarely flooded-----	60	Slight		Moderate Slope/erodibility	0.50	Well suited	
Friedliver-----	20	Slight		Slight		Moderately suited Sandiness	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3525: Cajon-----	70	Slight		Slight		Moderately suited Sandiness	0.50
Friedliver-----	15	Slight		Slight		Moderately suited Sandiness	0.50
3526: Cajon-----	40	Slight		Slight		Well suited	
Hypoint-----	35	Slight		Slight		Moderately suited Sandiness	0.50
Arizo, occasionally flooded-----	15	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
3611: Burntshack, sand surface-----	50	Slight		Slight		Well suited	
Burntshack-----	35	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
3612: Burntshack-----	75	Slight		Slight		Moderately suited Sandiness	0.50
Burntshack, occasionally flooded-----	20	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
3676: Morongo, loamy sand, very rarely flooded-----	80	Slight		Slight		Well suited	
3677: Morongo-----	80	Slight		Slight		Moderately suited Sandiness	0.50
3679: Morongo, cool-----	55	Slight		Slight		Moderately suited Sandiness	0.50
Jumborox-----	20	Slight		Slight		Well suited	
3680: Morongo-----	85	Slight		Slight		Moderately suited Sandiness	0.50
3681: Morongo, very rarely flooded-----	45	Slight		Slight		Moderately suited Sandiness	0.50
Jumborox, dry-----	35	Slight		Moderate Slope/erodibility	0.50	Well suited	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3682: Morongo, cool-----	50	Slight		Slight		Moderately suited Sandiness	0.50
Jumborox-----	15	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Urban land-----	15	Not rated		Not rated		Not rated	
3683: Morongo-----	55	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness	0.50
Bluecut, very rarely flooded-----	30	Slight		Slight		Well suited	
3684: Morongo, warm-----	85	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
3685: Morongo, cool-----	65	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Sandiness	0.50 0.50
Desertqueen, undulating-----	15	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
3690: Nasagold-----	85	Slight		Slight		Well suited	
3695: Gocougs-----	80	Slight		Slight		Moderately suited Sandiness	0.50
4031: Crosgrain-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Crackerjack-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Pinkcan, dry-----	15	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
4041: Silvermine-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Helendale-----	30	Slight		Moderate Slope/erodibility	0.50	Well suited	
Burntshack, very rarely flooded-----	20	Slight		Slight		Well suited	
4064: Gravesumit-----	55	Slight		Slight		Well suited	
Helendale, sandy surface-----	35	Slight		Slight		Well suited	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4071: Helendale-----	65	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Desertqueen, very rarely flooded-----	15	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
4091: Littlefargo-----	85	Slight		Severe Slope/erodibility	0.95	Moderately suited Slope	0.50
4245: Bluecut-----	40	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Morongo, very rarely flooded-----	25	Slight		Slight		Moderately suited Sandiness	0.50
Yander, very rarely flooded-----	15	Slight		Slight		Well suited	
4260: Minhoyt-----	45	Slight		Moderate Slope/erodibility	0.50	Well suited	
Corbilt, rarely flooded-----	40	Slight		Slight		Moderately suited Sandiness	0.50
4265: Werewolf, warm-----	80	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Rock fragments	0.50 0.50
4270: Yuccabutte, extremely cobbly sandy loam-----	95	Moderate Slope/erodibility	0.50	Moderate Slope/erodibility	0.50	Poorly suited Slope Rock fragments	1.00 0.50
4271: Yuccabutte, warm----	60	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Low strength	0.50 0.50
Arizo, rarely flooded-----	30	Slight		Moderate Slope/erodibility	0.50	Well suited	
4275: Pinkcan-----	35	Slight		Slight		Well suited	
Werewolf-----	25	Slight		Slight		Well suited	
Gocougs, warm-----	15	Slight		Moderate Slope/erodibility	0.50	Moderately suited Low strength	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4280: Mekkadale-----	55	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Low strength	1.00 0.50
Edalph, warm-----	25	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
4285: Typic Argidurids----	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Coppermine-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Minhoyt, warm-----	25	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Moderately suited Slope Low strength	0.50 0.50
4403: Arizo, rarely flooded, channeled-	50	Slight		Slight		Moderately suited Sandiness Rock fragments	0.50 0.50
Arizo, rarely flooded-----	25	Slight		Slight		Moderately suited Sandiness Rock fragments	0.50 0.50
Arizo-----	20	Slight		Moderate Slope/erodibility	0.50	Well suited	
4440: Dragonwash, occasionally flooded-----	55	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
Dragonwash, frequently flooded-	35	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
4450: Morongo, occasionally flooded-----	75	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
Morongo, frequently flooded-----	15	Slight		Slight		Poorly suited Flooding Sandiness	1.00 0.50
4605: Pinecity, moist-----	80	Slight		Moderate Slope/erodibility	0.50	Well suited	



# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4606: Pinecity-----	60	Moderate Slope/erodibility	0.50	Moderate Slope/erodibility	0.50	Poorly suited Slope	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
4607: Pinecity-----	85	Slight		Moderate Slope/erodibility	0.50	Moderately suited Rock fragments Sandiness Slope	0.50 0.50 0.50
4608: Pinecity-----	60	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope Rock fragments	0.50 0.50
Rock outcrop-----	30	Not rated		Not rated		Not rated	
4610: Desertqueen-----	35	Slight		Moderate Slope/erodibility	0.50	Well suited	
Jumborox, warm-----	25	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
4615: Desertqueen, cool---	45	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Jumborox-----	25	Slight		Slight		Well suited	
Rock outcrop-----	15	Not rated		Not rated		Not rated	
4620: Stranger-----	40	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Grubstake, moist-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
4625: Grinder-----	50	Slight		Moderate Slope/erodibility	0.50	Well suited	
Grinder, cool-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Pinkcan, cool-----	15	Slight		Moderate Slope/erodibility	0.50	Moderately suited Slope	0.50
4630: Thunderclap-----	50	Slight		Moderate Slope/erodibility	0.50	Moderately suited Sandiness Slope	0.50 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4630: Smithcanyon-----	30	Slight		Severe Slope/erodibility	0.95	Moderately suited Slope Rock fragments	0.50 0.50
4804: Rock outcrop-----	45	Not rated		Not rated		Not rated	
Ironped-----	25	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Pinecity-----	20	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
4805: Rock outcrop-----	50	Not rated		Not rated		Not rated	
Ironped, cool-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
4806: Rock outcrop-----	90	Not rated		Not rated		Not rated	
4811: Rock outcrop-----	85	Not rated		Not rated		Not rated	
Pioneertown-----	10	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
4825: Rock outcrop-----	30	Not rated		Not rated		Not rated	
Grubstake-----	20	Slight		Moderate Slope/erodibility	0.50	Well suited	
Cajon, rarely flooded-----	20	Slight		Moderate Slope/erodibility	0.50	Well suited	
Stranger, warm-----	15	Slight		Slight		Moderately suited Sandiness	0.50
4830: Rock outcrop-----	80	Not rated		Not rated		Not rated	
Pinecity, cool-----	10	Moderate Slope/erodibility	0.50	Moderate Slope/erodibility	0.50	Poorly suited Slope Rock fragments	1.00 1.00
4900: Rock outcrop-----	65	Not rated		Not rated		Not rated	
Aguilareal-----	15	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4900: Lostpalms-----	15	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part III (Site Preparation)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1220:					
Jadestorm-----	60	Unsuited		Poorly suited	
		Restrictive layer	1.00	Slope	0.50
		Slope	0.50	Rock fragments	0.50
		Rock fragments	0.50		
Blackeagle, cool----	20	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	0.50
Rock outcrop-----	10	Not rated		Not rated	
1225:					
Blackeagle-----	65	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	0.50
Rock outcrop-----	15	Not rated		Not rated	
1230:					
Jadestorm-----	45	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	0.50
		Rock fragments	0.50		
Jadestorm, cool----	20	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	1.00
		Rock fragments	0.50		
Rock outcrop-----	15	Not rated		Not rated	
1240:					
Meccapass-----	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Bulletproof-----	20	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Rock outcrop-----	10	Not rated		Not rated	
1241:					
Meccapass-----	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Seanna-----	20	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Contactmine, dry----	20	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1242:					
Meccapass-----	40	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Jadestorm-----	25	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	1.00
		Rock fragments	0.50		
Rock outcrop-----	15	Not rated		Not rated	
1250:					
Ironlung-----	50	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Ironlung, cool-----	20	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Rock outcrop-----	15	Not rated		Not rated	
1255:					
Goldenhills-----	40	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Bulletproof-----	15	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Fanhill-----	15	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Whiterobe-----	15	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Rock fragments	0.50
1260:					
Whiterobe-----	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Bigbernie-----	20	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Rock fragments	0.50
Whiterobe, cool-----	15	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
1410:					
Missionwell-----	50	Unsuited		Unsuited	
		Restrictive layer	1.00	Restrictive layer	1.00
		Slope	0.50	Slope	0.50
				Rock fragments	0.50
Rock outcrop-----	20	Not rated		Not rated	
Missionwell, high elevation-----	15	Unsuited		Unsuited	
		Restrictive layer	1.00	Restrictive layer	1.00
		Slope	0.50	Slope	0.50
				Rock fragments	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1415: Bolero-----	60	Unsuited Restrictive layer Slope Rock fragments	1.00 1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
Rock outcrop-----	20	Not rated		Not rated	
1504: Rizzo, rarely flooded, stony-----	50	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Rizzo, occasionally flooded, stony-----	35	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
1510: Carrizo, very gravelly sandy loam	85	Well suited		Poorly suited Rock fragments	0.50
1511: Carrizo, channeled--	75	Well suited		Poorly suited Rock fragments	0.50
Carrizo, occasionally flooded-----	15	Well suited		Poorly suited Rock fragments	0.50
1512: Carrizo, extremely gravelly sandy loam	80	Well suited		Poorly suited Rock fragments	0.50
1513: Carrizo-----	60	Well suited		Poorly suited Rock fragments	0.50
Carrizo, occasionally flooded, channeled-	20	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Rubylee-----	15	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
1514: Carrizo, rarely flooded-----	40	Well suited		Well suited	
Pintobasin, fine sandy loam-----	30	Well suited		Well suited	
Rubylee-----	15	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50



# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1515: Pintobasin-----	80	Well suited		Well suited	
Carrizo, occasionally flooded-----	15	Well suited		Poorly suited Rock fragments	0.50
1516: Pintobasin, fine sandy loam-----	90	Well suited		Well suited	
1517: Pintobasin-----	65	Well suited		Well suited	
Dalelake-----	25	Well suited		Well suited	
1520: Pintobasin, loamy sand-----	80	Well suited		Well suited	
1522: Pintobasin, rarely flooded-----	85	Well suited		Well suited	
1523: Pintobasin, rarely flooded-----	50	Well suited		Well suited	
Aquapeak-----	25	Well suited		Well suited	
Pintobasin, occasionally flooded-----	20	Well suited		Well suited	
1524: Pintobasin, rarely flooded-----	90	Well suited		Well suited	
1525: Pintobasin, occasionally flooded-----	45	Well suited		Well suited	
Pintobasin, rarely flooded-----	35	Well suited		Well suited	
1526: Pintobasin, rarely flooded-----	55	Well suited		Well suited	
Joetree-----	20	Well suited		Well suited	
Patscamp-----	15	Well suited		Well suited	
1527: Pintobasin, moist---	90	Well suited		Well suited	
1530: Dalelake, fine sand-	85	Well suited		Well suited	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1531: Dalelake-----	60	Well suited		Well suited	
Pintobasin, rarely flooded-----	30	Well suited		Well suited	
1540: Carrizo, very rarely flooded-----	35	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Carrizo, stable-----	25	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Carrizo, occasionally flooded, rocky surface-----	20	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Russiroks-----	20	Well suited		Poorly suited Rock fragments	0.50
1541: Carrizo, stable-----	50	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Cambidic Haplodurids	40	Well suited		Poorly suited Rock fragments	0.50
1542: Carrizo, very rarely flooded-----	70	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Carrizo, occasionally flooded-----	20	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
1550: Buzzardsprings, stable-----	35	Well suited		Well suited	
Coxpin-----	25	Well suited		Well suited	
Dalelake-----	20	Well suited		Well suited	
1555: Goldrose-----	35	Well suited		Well suited	
Carsitas, very rarely flooded-----	30	Well suited		Well suited	
Chemwash, rarely flooded-----	25	Well suited		Poorly suited Rock fragments	0.50
2003: Emptygun-----	100	Poorly suited Slope	0.50	Poorly suited Slope	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2060:					
Joetree, very rarely flooded-----	35	Well suited		Well suited	
Dalelake-----	30	Well suited		Well suited	
Pintobasin, fine sandy loam-----	25	Well suited		Well suited	
2065:					
Dalelake-----	30	Well suited		Well suited	
Aquapeak-----	25	Well suited		Poorly suited Rock fragments	0.50
Coxpin-----	25	Well suited		Well suited	
2067:					
Aquapeak, overblown-	30	Well suited		Well suited	
Buzzardsprings-----	25	Well suited		Well suited	
Dalelake, thick sandy surface-----	20	Well suited		Well suited	
Buzzardsprings, steep-----	15	Poorly suited Slope	0.50	Poorly suited Slope	0.50
2068:					
Aquapeak-----	45	Well suited		Well suited	
Carpetflat, nongravelly surface	35	Unsuited Restrictive layer	1.00	Poorly suited Restrictive layer	0.50
Pintobasin-----	15	Well suited		Well suited	
2070:					
Missionsweet-----	60	Well suited		Poorly suited Rock fragments	0.50
Carpetflat-----	25	Unsuited Restrictive layer Rock fragments	1.00 0.50	Poorly suited Rock fragments	0.50
2075:					
Oldale-----	50	Well suited		Poorly suited Rock fragments	0.50
Missionsweet-----	30	Well suited		Poorly suited Rock fragments	0.50
2076:					
Oldale-----	40	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Carrizo-----	30	Well suited		Poorly suited Rock fragments	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2077:					
Oldale-----	50	Well suited		Poorly suited Rock fragments	0.50
Carrizo-----	25	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Carrizo, very rarely flooded----	15	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
2085:					
Rainbowsend-----	45	Unsuited Restrictive layer	1.00	Unsuited Rock fragments	1.00
		Slope	1.00	Slope	1.00
		Rock fragments	1.00		
Goldenbell-----	35	Well suited		Poorly suited Rock fragments	0.50
2090:					
Deprave-----	35	Well suited		Poorly suited Rock fragments	0.50
Rockhound-----	25	Well suited		Poorly suited Rock fragments	0.50
Rizzo-----	20	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
2091:					
Deprave-----	60	Well suited		Poorly suited Rock fragments	0.50
Roostertail-----	15	Well suited		Poorly suited Rock fragments	0.50
2100:					
Perurose-----	50	Well suited		Poorly suited Rock fragments	0.50
Coxpin-----	25	Well suited		Well suited	
Pintobasin, gravelly surface----	15	Well suited		Poorly suited Rock fragments	0.50
2101:					
Perurose, rarely flooded-----	60	Well suited		Poorly suited Rock fragments	0.50
Pintobasin, rarely flooded-----	35	Well suited		Well suited	
2110:					
Descent-----	80	Unsuited Slope	1.00	Unsuited Slope Rock fragments	1.00 0.50
Descent, stable-----	15	Well suited		Poorly suited Rock fragments	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2111: Descent, warm-----	45	Unsuited Slope	1.00	Unsuited Slope Rock fragments	1.00 0.50
Rubylee, very rarely flooded-----	40	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
2120: Rizzo, rarely flooded-----	35	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Deprave-----	35	Well suited		Poorly suited Rock fragments	0.50
Rizzo, frequently flooded-----	20	Well suited		Well suited	
2121: Rizzo, rubbly-----	90	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
2130: Goldenbell-----	55	Well suited		Poorly suited Rock fragments	0.50
Descent-----	40	Well suited		Poorly suited Rock fragments	0.50
2140: Rockhound, cobbly---	85	Well suited		Poorly suited Rock fragments	0.50
2402: Rizzo-----	70	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Rizzo, frequently flooded-----	20	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
2403: Rizzo-----	80	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Rizzo, occasionally flooded-----	15	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
2404: Rizzo, occasionally flooded-----	60	Well suited		Poorly suited Rock fragments	0.50
Rizzo, very rarely flooded-----	35	Well suited		Poorly suited Rock fragments	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2405:					
Carrizo, rarely flooded-----	65	Well suited		Well suited	
Carrizo, occasionally flooded-----	25	Well suited		Poorly suited Rock fragments	0.50
2406:					
Pintobasin, frequently flooded-	50	Well suited		Well suited	
Carrizo, occasionally flooded-----	40	Well suited		Poorly suited Rock fragments	0.50
2407:					
Pintobasin, rarely flooded-----	45	Well suited		Well suited	
Carrizo, occasionally flooded-----	30	Well suited		Poorly suited Rock fragments	0.50
Carrizo, frequently flooded-----	20	Well suited		Poorly suited Rock fragments	0.50
2408:					
Rizzo, frequently flooded-----	55	Well suited		Well suited	
Rizzo, very rarely flooded-----	35	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
2409:					
Rizzo, frequently flooded-----	35	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Chemwash, frequently flooded-	30	Well suited		Poorly suited Rock fragments	0.50
Carsitas, occasionally flooded, braided---	25	Well suited		Well suited	
2420:					
Carsitas, frequently flooded-	45	Well suited		Well suited	
Carsitas, occasionally flooded-----	40	Well suited		Well suited	
Carsitas, rarely flooded-----	15	Well suited		Well suited	



# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2421:					
Carsitas, very rarely flooded-----	55	Well suited		Well suited	
Carsitas, rarely flooded-----	25	Well suited		Well suited	
2431:					
Chemwash, frequently flooded, braided---	60	Well suited		Poorly suited Rock fragments	0.50
Chemwash, frequently flooded-	25	Well suited		Poorly suited Rock fragments	0.50
2440:					
Rizzo-----	35	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Rizzo, occasionally flooded-----	30	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Rizzo, extremely stony-----	15	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
2715:					
Dalelake-----	35	Well suited		Well suited	
Sheephole-----	30	Poorly suited Rock fragments	0.50	Well suited	
Pintobasin-----	25	Well suited		Well suited	
2716:					
Dalelake, steep----	75	Well suited		Well suited	
Dalelake-----	20	Well suited		Well suited	
2717:					
Dalelake-----	40	Well suited		Well suited	
Rock outcrop-----	25	Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Well suited		Poorly suited Rock fragments	0.50
2718:					
Dalelake-----	55	Well suited		Well suited	
Sheephole, gravelly surface-----	45	Well suited		Well suited	
2820:					
Rock outcrop-----	60	Not rated		Not rated	
Impedimenta-----	25	Unsuited Restrictive layer Slope	1.00 0.50	Poorly suited Restrictive layer Slope	0.50 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.-Land Management, Part III (Site Preparation)-Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2825:					
Rock outcrop-----	35	Not rated		Not rated	
Supplymine-----	25	Unsuited		Poorly suited	
		Restrictive layer	1.00	Slope	0.50
		Slope	0.50	Rock fragments	0.50
		Rock fragments	0.50		
Bolero, dry-----	15	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	1.00
		Rock fragments	1.00		
Ironage-----	15	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	1.00	Rock fragments	1.00
		Restrictive layer	0.50		
2830:					
Rock outcrop-----	80	Not rated		Not rated	
Blackeagle, cool----	10	Unsuited		Unsuited	
		Restrictive layer	1.00	Rock fragments	1.00
		Rock fragments	1.00	Slope	1.00
		Slope	1.00		
2835:					
Rock outcrop-----	40	Not rated		Not rated	
Blackeagle-----	40	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	0.50
2840:					
Rock outcrop-----	65	Not rated		Not rated	
Jadestorm-----	30	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	1.00
		Rock fragments	0.50		
3110:					
Coppermine, cool----	40	Unsuited		Poorly suited	
		Restrictive layer	1.00	Slope	0.50
		Slope	0.50	Rock fragments	0.50
		Rock fragments	0.50	Restrictive layer	0.50
Stranger-----	30	Unsuited		Unsuited	
		Restrictive layer	1.00	Restrictive layer	1.00
3120:					
Aguilareal-----	40	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	1.00
		Rock fragments	1.00		
Blackeagle-----	20	Unsuited		Unsuited	
		Restrictive layer	1.00	Slope	1.00
		Slope	1.00	Rock fragments	0.50
Rock outcrop-----	15	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3213: Dalvord-----	35	Unsuited Restrictive layer Slope	1.00 0.50	Poorly suited Slope Rock fragments	0.50 0.50
Aguilareal-----	30	Unsuited Restrictive layer Slope Rock fragments	1.00 1.00 1.00	Unsuited Slope Rock fragments	1.00 1.00
Rock outcrop-----	25	Not rated		Not rated	
3242: Langwell-----	50	Unsuited Restrictive layer Slope	1.00 0.50	Poorly suited Slope Restrictive layer	0.50 0.50
Rock outcrop-----	25	Not rated		Not rated	
Helendale, cool-----	20	Well suited		Well suited	
3285: Pinecity-----	30	Unsuited Slope	1.00	Unsuited Slope Rock fragments	1.00 0.50
Contactmine-----	20	Poorly suited Slope	0.50	Poorly suited Slope Rock fragments	0.50 0.50
Desertqueen-----	20	Unsuited Rock fragments Slope	1.00 0.50	Unsuited Rock fragments Slope	1.00 0.50
Rock outcrop-----	15	Not rated		Not rated	
3286: Pinecity, gravelly loamy sand-----	85	Unsuited Slope Rock fragments	1.00 1.00	Unsuited Slope Rock fragments	1.00 1.00
3291: Smithcanyon-----	40	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Stubbespring-----	25	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
Rock outcrop-----	20	Not rated		Not rated	
3292: Smithcanyon-----	35	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Pinecity-----	25	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
Rock outcrop-----	25	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3293: Smithcanyon-----	50	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Pinecity-----	25	Unsuited Slope	1.00	Unsuited Slope	1.00
3294: Smithcanyon, dry----	80	Unsuited Slope	1.00	Unsuited Slope	1.00
3295: Desertqueen, dry----	40	Poorly suited Slope Rock fragments	0.50 0.50	Poorly suited Slope Rock fragments	0.50 0.50
Hexie-----	20	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
Rock outcrop-----	20	Not rated		Not rated	
3296: Desertqueen-----	45	Poorly suited Slope Rock fragments	0.50 0.50	Unsuited Rock fragments Slope	1.00 0.50
Pinecity-----	35	Poorly suited Slope Rock fragments	0.50 0.50	Poorly suited Slope Rock fragments	0.50 0.50
3297: Desertqueen, warm----	40	Poorly suited Rock fragments Slope	0.50 0.50	Poorly suited Rock fragments Slope	0.50 0.50
Contactmine, dry----	20	Poorly suited Slope Rock fragments	0.50 0.50	Poorly suited Rock fragments Slope	0.50 0.50
Seanna, dry-----	20	Poorly suited Slope	0.50	Poorly suited Slope	0.50
3325: Ironped, warm-----	30	Poorly suited Slope Rock fragments	0.50 0.50	Poorly suited Slope Rock fragments	0.50 0.50
Rock outcrop-----	20	Not rated		Not rated	
Hexie-----	15	Unsuited Slope	1.00	Unsuited Slope	1.00
Ironped-----	15	Unsuited Slope	1.00	Unsuited Slope	1.00
3335: Xeric Torriorthents-	40	Unsuited Slope	1.00	Unsuited Slope	1.00
Rock outcrop-----	25	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3335: Xeric Torriorthents, warm	25	Unsuited Slope	1.00	Unsuited Slope	1.00
3336: Xeric Torriorthents-	45	Unsuited Slope	1.00	Unsuited Slope	1.00
Bigbernie-----	25	Unsuited Slope	1.00	Unsuited Slope Rock fragments	1.00 0.50
3340: Seanna-----	35	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
Grubstake, moist----	20	Unsuited Slope Restrictive layer Rock fragments	1.00 0.50 0.50	Unsuited Slope Rock fragments	1.00 0.50
Pinecity-----	15	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
3345: Bigcanyon-----	55	Unsuited Slope	1.00	Unsuited Slope	1.00
Bigcanyon, cool----	20	Unsuited Slope	1.00	Unsuited Slope	1.00
3440: Pacific Mesa, steep-	65	Unsuited Slope Restrictive layer Rock fragments	1.00 1.00 1.00	Unsuited Slope Rock fragments	1.00 1.00
Pacific Mesa-----	30	Unsuited Restrictive layer Rock fragments	1.00 0.50	Poorly suited Rock fragments	0.50
3509: Cajon, very rarely flooded-----	60	Well suited		Well suited	
Friedliver-----	20	Well suited		Poorly suited Rock fragments	0.50
3525: Cajon-----	70	Well suited		Well suited	
Friedliver-----	15	Well suited		Well suited	
3526: Cajon-----	40	Well suited		Well suited	
Hypoint-----	35	Well suited		Well suited	
Arizo, occasionally flooded-----	15	Well suited		Poorly suited Rock fragments	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3611: Burntshack, sand surface-----	50	Well suited		Well suited	
Burntshack-----	35	Well suited		Well suited	
3612: Burntshack-----	75	Well suited		Well suited	
Burntshack, occasionally flooded-----	20	Well suited		Well suited	
3676: Morongo, loamy sand, very rarely flooded-----	80	Well suited		Well suited	
3677: Morongo-----	80	Well suited		Well suited	
3679: Morongo, cool-----	55	Well suited		Well suited	
Jumborox-----	20	Well suited		Well suited	
3680: Morongo-----	85	Well suited		Well suited	
3681: Morongo, very rarely flooded-----	45	Well suited		Well suited	
Jumborox, dry-----	35	Well suited		Well suited	
3682: Morongo, cool-----	50	Well suited		Well suited	
Jumborox-----	15	Well suited		Well suited	
Urban land-----	15	Not rated		Not rated	
3683: Morongo-----	55	Well suited		Well suited	
Bluecut, very rarely flooded-----	30	Well suited		Well suited	
3684: Morongo, warm-----	85	Well suited		Well suited	
3685: Morongo, cool-----	65	Well suited		Well suited	
Desertqueen, undulating-----	15	Poorly suited Slope	0.50	Poorly suited Slope	0.50
3690: Nasagold-----	85	Well suited		Well suited	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3695: Gocougs-----	80	Well suited		Well suited	
4031: Crosgrain-----	50	Unsuited Restrictive layer	1.00	Poorly suited Rock fragments	0.50
		Slope	0.50	Slope	0.50
Crackerjack-----	30	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Pinkcan, dry-----	15	Well suited		Well suited	
4041: Silvermine-----	40	Well suited		Well suited	
Helendale-----	30	Well suited		Well suited	
Burntshack, very rarely flooded-----	20	Well suited		Well suited	
4064: Gravesumit-----	55	Well suited		Well suited	
Helendale, sandy surface-----	35	Well suited		Well suited	
4071: Helendale-----	65	Well suited		Well suited	
Desertqueen, very rarely flooded-----	15	Well suited		Poorly suited Rock fragments	0.50
4091: Littlefargo-----	85	Well suited		Well suited	
4245: Bluecut-----	40	Well suited		Well suited	
Morongo, very rarely flooded-----	25	Well suited		Well suited	
Yander, very rarely flooded-----	15	Well suited		Well suited	
4260: Minhoyt-----	45	Unsuited Restrictive layer	1.00	Poorly suited Restrictive layer	0.50
Corbilt, rarely flooded-----	40	Well suited		Well suited	
4265: Werewolf, warm-----	80	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
4270: Yuccabutte, extremely cobbly sandy loam-----	95	Poorly suited Slope Rock fragments	0.50 0.50	Poorly suited Slope Rock fragments	0.50 0.50



# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)	Value	Suitability for mechanical site preparation (surface)	Value
		Rating class and limiting features		Rating class and limiting features	
4271:					
Yuccabutte, warm----	60	Well suited		Well suited	
Arizo, rarely flooded-----	30	Well suited		Well suited	
4275:					
Pinkcan-----	35	Well suited		Well suited	
Werewolf-----	25	Well suited		Well suited	
Gocougs, warm-----	15	Well suited		Well suited	
4280:					
Mekkadale-----	55	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Edalph, warm-----	25	Poorly suited Slope	0.50	Poorly suited Slope	0.50
4285:					
Typic Argidurids----	35	Poorly suited Slope	0.50	Poorly suited Rock fragments Slope	0.50 0.50
Coppermine-----	30	Unsuited Restrictive layer Slope	1.00 0.50	Poorly suited Rock fragments Slope Restrictive layer	0.50 0.50 0.50
Minhoyt, warm-----	25	Unsuited Restrictive layer	1.00	Poorly suited Restrictive layer	0.50
4403:					
Arizo, rarely flooded, channeled-	50	Well suited		Poorly suited Rock fragments	0.50
Arizo, rarely flooded-----	25	Well suited		Poorly suited Rock fragments	0.50
Arizo-----	20	Well suited		Poorly suited Rock fragments	0.50
4440:					
Dragonwash, occasionally flooded-----	55	Well suited		Well suited	
Dragonwash, frequently flooded-	35	Well suited		Well suited	
4450:					
Morongo, occasionally flooded-----	75	Well suited		Well suited	
Morongo, frequently flooded-----	15	Well suited		Well suited	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4605: Pinecity, moist-----	80	Well suited		Well suited	
4606: Pinecity-----	60	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Rock outcrop-----	25	Not rated		Not rated	
4607: Pinecity-----	85	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
4608: Pinecity-----	60	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Rock outcrop-----	30	Not rated		Not rated	
4610: Desertqueen-----	35	Well suited		Poorly suited Rock fragments	0.50
Jumborox, warm-----	25	Well suited		Well suited	
Rock outcrop-----	20	Not rated		Not rated	
4615: Desertqueen, cool---	45	Poorly suited Rock fragments Slope	0.50 0.50	Poorly suited Rock fragments Slope	0.50 0.50
Jumborox-----	25	Well suited		Well suited	
Rock outcrop-----	15	Not rated		Not rated	
4620: Stranger-----	40	Unsuited Restrictive layer Slope	1.00 1.00	Unsuited Restrictive layer Slope	1.00 1.00
Rock outcrop-----	35	Not rated		Not rated	
Grubstake, moist----	20	Unsuited Restrictive layer Slope	1.00 0.50	Poorly suited Slope	0.50
4625: Grinder-----	50	Unsuited Restrictive layer	1.00	Poorly suited Restrictive layer	0.50
Grinder, cool-----	20	Unsuited Restrictive layer Slope	1.00 0.50	Poorly suited Slope Restrictive layer	0.50 0.50
Pinkcan, cool-----	15	Well suited		Well suited	
4630: Thunderclap-----	50	Well suited		Well suited	
Smithcanyon-----	30	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4804:					
Rock outcrop-----	45	Not rated		Not rated	
Ironped-----	25	Unsuited Slope	1.00	Unsuited Slope	1.00
Pinecity-----	20	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
4805:					
Rock outcrop-----	50	Not rated		Not rated	
Ironped, cool-----	30	Poorly suited Slope	0.50	Poorly suited Slope Rock fragments	0.50 0.50
4806:					
Rock outcrop-----	90	Not rated		Not rated	
4811:					
Rock outcrop-----	85	Not rated		Not rated	
Pioneertown-----	10	Unsuited Restrictive layer Slope	1.00 1.00	Unsuited Slope Restrictive layer	1.00 0.50
4825:					
Rock outcrop-----	30	Not rated		Not rated	
Grubstake-----	20	Unsuited Restrictive layer	1.00	Well suited	
Cajon, rarely flooded-----	20	Well suited		Well suited	
Stranger, warm-----	15	Unsuited Restrictive layer	1.00	Unsuited Restrictive layer	1.00
4830:					
Rock outcrop-----	80	Not rated		Not rated	
Pinecity, cool-----	10	Unsuited Rock fragments Slope	1.00 0.50	Unsuited Rock fragments Slope	1.00 0.50
4900:					
Rock outcrop-----	65	Not rated		Not rated	
Aguilareal-----	15	Unsuited Restrictive layer Rock fragments Slope	1.00 1.00 1.00	Unsuited Rock fragments Slope	1.00 1.00
Lostpalms-----	15	Unsuited Restrictive layer Rock fragments Slope	1.00 1.00 1.00	Unsuited Rock fragments Slope Restrictive layer	1.00 1.00 0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1220:					
Jadestorm-----	60	Low		Low	
Blackeagle, cool----	20	Low		Low	
Rock outcrop-----	10	Not rated		Not rated	
1225:					
Blackeagle-----	65	Low		Low	
Rock outcrop-----	15	Not rated		Not rated	
1230:					
Jadestorm-----	45	Low		Low	
Jadestorm, cool----	20	Low		Low	
Rock outcrop-----	15	Not rated		Not rated	
1240:					
Meccapass-----	45	Low		Low	
Bulletproof-----	20	Low		Low	
Rock outcrop-----	10	Not rated		Not rated	
1241:					
Meccapass-----	45	Low		Low	
Seanna-----	20	High		Low	
		Texture/slope/ surface layer thickness/rock fragments	1.00		
Contactmine, dry----	20	High		Low	
		Texture/slope/ surface layer thickness/rock fragments	1.00		
1242:					
Meccapass-----	40	Low		Low	
Jadestorm-----	25	Low		Low	
Rock outcrop-----	15	Not rated		Not rated	
1250:					
Ironlung-----	50	High		Low	
		Texture/slope/ surface layer thickness	1.00		

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality		
		Rating class and limiting features	Value	Rating class and limiting features	Value
1250: Ironlung, cool-----	20	High Texture/slope/ surface layer thickness	1.00	Low	
Rock outcrop-----	15	Not rated		Not rated	
1255: Goldenhills-----	40	High Texture/slope/ surface layer thickness	1.00	Moderate Soil reaction	0.50
Bulletproof-----	15	High Texture/slope/ surface layer thickness	1.00	Low	
Fanhill-----	15	Low		Low	
Whiterobe-----	15	High Texture/slope/ surface layer thickness	1.00	Moderate Soil reaction	0.50
1260: Whiterobe-----	45	High Texture/slope/ surface layer thickness	1.00	Moderate Soil reaction	0.50
Bigbernie-----	20	High Texture/slope/ surface layer thickness	1.00	Low	
Whiterobe, cool-----	15	High Texture/slope/ surface layer thickness	1.00	Moderate Soil reaction	0.50
1410: Missionwell-----	50	Low		Low	
Rock outcrop-----	20	Not rated		Not rated	
Missionwell, high elevation-----	15	Low		Low	
1415: Bolero-----	60	Low		Low	
Rock outcrop-----	20	Not rated		Not rated	
1504: Rizzo, rarely flooded, stony-----	50	High Texture/surface layer thickness/rock fragments	1.00	Low	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1504: Rizzo, occasionally flooded, stony-----	35	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
1510: Carrizo, very gravelly sandy loam	85	High Texture/surface layer thickness/rock fragments	1.00	Low	
1511: Carrizo, channeled--	75	High Texture/surface layer thickness/rock fragments	1.00	Low	
Carrizo, occasionally flooded-----	15	High Texture/surface layer thickness/rock fragments	1.00	Low	
1512: Carrizo, extremely gravelly sandy loam	80	High Texture/slope/ rock fragments/ surface layer thickness	1.00	Low	
1513: Carrizo-----	60	Moderate Texture/surface layer thickness/rock fragments	0.50	Low	
Carrizo, occasionally flooded, channeled-	20	High Texture/surface layer thickness/rock fragments	1.00	Low	
Rubylee-----	15	Moderate Texture/surface layer thickness/rock fragments	0.50	Moderate Soil reaction	0.50

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1514: Carrizo, rarely flooded-----	40	High Texture/surface layer thickness/rock fragments	1.00	Low	
Pintobasin, fine sandy loam-----	30	Low		Low	
Rubylee-----	15	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
1515: Pintobasin-----	80	High Texture/surface layer thickness/rock fragments	1.00	Low	
Carrizo, occasionally flooded-----	15	High Texture/surface layer thickness/rock fragments	1.00	Low	
1516: Pintobasin, fine sandy loam-----	90	Low		Low	
1517: Pintobasin-----	65	High Texture/surface layer thickness/rock fragments	1.00	Low	
Dalelake-----	25	High Texture/surface layer thickness/rock fragments	1.00	Low	
1520: Pintobasin, loamy sand-----	80	High Texture/surface layer thickness/rock fragments	1.00	Low	



# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1522: Pintobasin, rarely flooded-----	85	High Texture/surface layer thickness/rock fragments	1.00	Low	
1523: Pintobasin, rarely flooded-----	50	High Texture/surface layer thickness/rock fragments	1.00	Low	
Aquapeak-----	25	High Texture/surface layer thickness/rock fragments	1.00	Low	
Pintobasin, occasionally flooded-----	20	High Texture/surface layer thickness/rock fragments	1.00	Low	
1524: Pintobasin, rarely flooded-----	90	High Texture/surface layer thickness/rock fragments	1.00	Low	
1525: Pintobasin, occasionally flooded-----	45	High Texture/surface layer thickness/rock fragments	1.00	Low	
Pintobasin, rarely flooded-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	
1526: Pintobasin, rarely flooded-----	55	High Texture/surface layer thickness/rock fragments	1.00	Low	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1526: Joetree-----	20	High Texture/surface layer thickness/rock fragments	1.00	Low	
Patscamp-----	15	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
1527: Pintobasin, moist---	90	High Texture/surface layer thickness/rock fragments	1.00	Low	
1530: Dalelake, fine sand-	85	High Texture/surface layer thickness/rock fragments	1.00	Low	
1531: Dalelake-----	60	High Texture/surface layer thickness/rock fragments	1.00	Low	
Pintobasin, rarely flooded-----	30	High Texture/surface layer thickness/rock fragments	1.00	Low	
1540: Carrizo, very rarely flooded----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	
Carrizo, stable----	25	Moderate Texture/surface layer thickness/rock fragments	0.50	Low	
Carrizo, occasionally flooded, rocky surface-----	20	High Texture/surface layer thickness/rock fragments	1.00	Low	

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Value	Potential for seedling mortality	Value
		Rating class and limiting features		Rating class and limiting features	
1540: Russioks-----	20	Low		Moderate Soil reaction	0.50
1541: Carrizo, stable-----	50	Moderate Texture/surface layer thickness/rock fragments	0.50	Low	
Cambidic Haplodurids	40	Low		Low	
1542: Carrizo, very rarely flooded-----	70	High Texture/surface layer thickness/rock fragments	1.00	Low	
Carrizo, occasionally flooded-----	20	High Texture/surface layer thickness/rock fragments	1.00	Low	
1550: Buzzardsprings, stable-----	35	Moderate Texture/surface layer thickness/rock fragments	0.50	Moderate Soil reaction	0.50
Coxpin-----	25	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
Dalelake-----	20	High Texture/surface layer thickness/rock fragments	1.00	Low	
1555: Goldrose-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	
Carsitas, very rarely flooded-----	30	High Texture/surface layer thickness/rock fragments	1.00	Low	

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1555: Chemwash, rarely flooded-----	25	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
2003: Emptygun-----	100	High Texture/slope/ surface layer thickness	1.00	Moderate Soil reaction	0.50
2060: Joetree, very rarely flooded-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	
Dalelake-----	30	High Texture/surface layer thickness/rock fragments	1.00	Low	
Pintobasin, fine sandy loam-----	25	Low		Low	
2065: Dalelake-----	30	High Texture/surface layer thickness/rock fragments	1.00	Low	
Aquapeak-----	25	Low		Low	
Coxpin-----	25	High Texture/surface layer thickness/rock fragments	1.00	Low	
2067: Aquapeak, overblown-	30	High Texture/surface layer thickness/rock fragments	1.00	Low	
Buzzardsprings-----	25	High Texture/surface layer thickness/rock fragments	1.00	Low	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2067:					
Dalelake, thick sandy surface-----	20	High Texture/surface layer thickness/rock fragments	1.00	Low	
Buzzardsprings, steep-----	15	High Texture/surface layer thickness/rock fragments	1.00	Low	
2068:					
Aquapeak-----	45	High Texture/surface layer thickness/rock fragments	1.00	Low	
Carpetflat, nongravelly surface	35	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
Pintobasin-----	15	High Texture/surface layer thickness/rock fragments	1.00	Low	
2070:					
Missionsweet-----	60	Low		Moderate Soil reaction	0.50
Carpetflat-----	25	Low		Moderate Soil reaction	0.50
2075:					
Oldale-----	50	Low		Low	
Missionsweet-----	30	Low		Moderate Soil reaction	0.50
2076:					
Oldale-----	40	Low		Low	
Carrizo-----	30	High Texture/surface layer thickness/rock fragments	1.00	Low	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
2077:			
Oldale-----	50	Low	Low
Carrizo-----	25	High Texture/surface layer thickness/rock fragments	Low
Carrizo, very rarely flooded----	15	High Texture/surface layer thickness/rock fragments	Low
2085:			
Rainbowsend-----	45	Low	Moderate Soil reaction
Goldenbell-----	35	Low	Low
2090:			
Deprave-----	35	Low	Low
Rockhound-----	25	High Texture/slope/ rock fragments/ surface layer thickness	Low
Rizzo-----	20	High Texture/slope/ rock fragments/ surface layer thickness	Low
2091:			
Deprave-----	60	Low	Low
Roostertail-----	15	Low	Low
2100:			
Perurose-----	50	Low	High Soil reaction
Coxpin-----	25	High Texture/surface layer thickness/rock fragments	Low
Pintobasin, gravelly surface---	15	High Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Value	Potential for seedling mortality	Value
		Rating class and limiting features		Rating class and limiting features	
2101: Perurose, rarely flooded-----	60	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
Pintobasin, rarely flooded-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	
2110: Descent-----	80	High Texture/slope/ surface layer thickness	1.00	Moderate Soil reaction	0.50
Descent, stable-----	15	Low		Moderate Soil reaction	0.50
2111: Descent, warm-----	45	High Texture/slope/ surface layer thickness	1.00	Moderate Soil reaction	0.50
Rubylee, very rarely flooded-----	40	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
2120: Rizzo, rarely flooded-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	
Deprave-----	35	Low		Low	
Rizzo, frequently flooded-----	20	High Texture/surface layer thickness/rock fragments	1.00	Low	
2121: Rizzo, rubbly-----	90	High Texture/surface layer thickness/rock fragments	1.00	Low	



# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality		
		Rating class and limiting features	Value	Rating class and limiting features	Value
2130: Goldenbell-----	55	Low		Low	
Descent-----	40	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
2140: Rockhound, cobbly---	85	High Texture/slope/ rock fragments/ surface layer thickness	1.00	Moderate Soil reaction	0.50
2402: Rizzo-----	70	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
Rizzo, frequently flooded-----	20	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
2403: Rizzo-----	80	High Texture/surface layer thickness/rock fragments	1.00	Low	
Rizzo, occasionally flooded-----	15	High Texture/surface layer thickness/rock fragments	1.00	Low	
2404: Rizzo, occasionally flooded-----	60	High Texture/surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
Rizzo, very rarely flooded-----	35	High Texture/surface layer thickness/rock fragments	1.00	Low	

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
2405: Carrizo, rarely flooded-----	65	High Texture/surface layer thickness/rock fragments	Low
Carrizo, occasionally flooded-----	25	High Texture/surface layer thickness/rock fragments	Low
2406: Pintobasin, frequently flooded-	50	High Texture/surface layer thickness/rock fragments	Low
Carrizo, occasionally flooded-----	40	High Texture/surface layer thickness/rock fragments	Low
2407: Pintobasin, rarely flooded-----	45	High Texture/surface layer thickness/rock fragments	Low
Carrizo, occasionally flooded-----	30	High Texture/surface layer thickness/rock fragments	Low
Carrizo, frequently flooded-----	20	High Texture/surface layer thickness/rock fragments	Low
2408: Rizzo, frequently flooded-----	55	High Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
2408: Rizzo, very rarely flooded-----	35	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction
2409: Rizzo, frequently flooded-----	35	High Texture/surface layer thickness/rock fragments	Low
Chemwash, frequently flooded-	30	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction
Carsitas, occasionally flooded, braided---	25	High Texture/surface layer thickness/rock fragments	Low
2420: Carsitas, frequently flooded-	45	High Texture/surface layer thickness/rock fragments	Low
Carsitas, occasionally flooded-----	40	High Texture/surface layer thickness/rock fragments	Low
Carsitas, rarely flooded-----	15	Low	Low
2421: Carsitas, very rarely flooded-----	55	High Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
2421: Carsitas, rarely flooded-----	25	High Texture/surface layer thickness/rock fragments	Low
2431: Chemwash, frequently flooded, braided---	60	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction
Chemwash, frequently flooded-	25	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction
2440: Rizzo-----	35	High Texture/surface layer thickness/rock fragments	Low
Rizzo, occasionally flooded-----	30	High Texture/surface layer thickness/rock fragments	Low
Rizzo, extremely stony-----	15	High Texture/slope/ rock fragments/ surface layer thickness	Low
2715: Dalelake-----	35	High Texture/surface layer thickness/rock fragments	Low
Sheephole-----	30	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
2715: Pintobasin-----	25	High Texture/surface layer thickness/rock fragments	Low
2716: Dalelake, steep-----	75	High Texture/surface layer thickness/rock fragments	Low
Dalelake-----	20	High Texture/surface layer thickness/rock fragments	Low
2717: Dalelake-----	40	High Texture/surface layer thickness/rock fragments	Low
Rock outcrop-----	25	Not rated	Not rated
Buzzardsprings, fine sand-----	20	High Texture/surface layer thickness/rock fragments	Low
2718: Dalelake-----	55	High Texture/surface layer thickness/rock fragments	Low
Sheephole, gravelly surface-----	45	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction
2820: Rock outcrop-----	60	Not rated	Not rated
Impedimenta-----	25	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
2825:			
Rock outcrop-----	35	Not rated	Not rated
Supplymine-----	25	Low	Low
Bolero, dry-----	15	Low	Moderate Soil reaction
Ironage-----	15	Low	Moderate Soil reaction
2830:			
Rock outcrop-----	80	Not rated	Not rated
Blackeagle, cool----	10	Low	Low
2835:			
Rock outcrop-----	40	Not rated	Not rated
Blackeagle-----	40	Low	Low
2840:			
Rock outcrop-----	65	Not rated	Not rated
Jadestorm-----	30	Low	Low
3110:			
Coppermine, cool----	40	High Texture/surface layer thickness/rock fragments	Low
Stranger-----	30	High Texture/surface layer thickness/rock fragments	Low
3120:			
Aguilareal-----	40	Low	Low
Blackeagle-----	20	Low	Low
Rock outcrop-----	15	Not rated	Not rated
3213:			
Dalvord-----	35	Low	Low
Aguilareal-----	30	Low	Low
Rock outcrop-----	25	Not rated	Not rated
3242:			
Langwell-----	50	High Texture/surface layer thickness/rock fragments	Low
Rock outcrop-----	25	Not rated	Not rated

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
3242: Helendale, cool-----	20	High Texture/rock fragments	Low
3285: Pinecity-----	30	High Texture/slope/ surface layer thickness	Low
Contactmine-----	20	High Texture/slope/ surface layer thickness/rock fragments	Low
Desertqueen-----	20	High Texture/surface layer thickness/rock fragments	Low
Rock outcrop-----	15	Not rated	Not rated
3286: Pinecity, gravelly loamy sand-----	85	High Texture/slope/ surface layer thickness	Low
3291: Smithcanyon-----	40	High Texture/surface layer thickness/rock fragments	Low
Stubbespring-----	25	High Texture/slope/ surface layer thickness	Low
Rock outcrop-----	20	Not rated	Not rated
3292: Smithcanyon-----	35	High Texture/surface layer thickness/rock fragments	Low
Pinecity-----	25	High Texture/slope/ surface layer thickness	Low
Rock outcrop-----	25	Not rated	Not rated



# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
3293: Smithcanyon-----	50	High Texture/slope/ surface layer thickness	Low
Pinecity-----	25	High Texture/slope/ surface layer thickness	Low
3294: Smithcanyon, dry----	80	High Texture/slope/ surface layer thickness	Low
3295: Desertqueen, dry----	40	High Texture/surface layer thickness/rock fragments	Low
Hexie-----	20	High Texture/slope/ surface layer thickness/rock fragments	Low
Rock outcrop-----	20	Not rated	Not rated
3296: Desertqueen-----	45	High Texture/surface layer thickness/rock fragments	Low
Pinecity-----	35	High Texture/surface layer thickness/rock fragments	Low
3297: Desertqueen, warm----	40	Moderate Texture/surface layer thickness/rock fragments	Low
Contactmine, dry----	20	High Texture/surface layer thickness/rock fragments	Low
Seanna, dry-----	20	High Texture/slope/ surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
3325:			
Ironped, warm-----	30	High Texture/slope/ surface layer thickness	Low
Rock outcrop-----	20	Not rated	Not rated
Hexie-----	15	High Texture/slope/ surface layer thickness/rock fragments	Low
Ironped-----	15	High Texture/slope/ surface layer thickness	Low
3335:			
Xeric Torriorthents-	40	High Texture/rock fragments	Low
Rock outcrop-----	25	Not rated	Not rated
Xeric Torriorthents, warm	25	High Texture/rock fragments	Low
3336:			
Xeric Torriorthents-	45	High Texture/rock fragments	Low
Bigbernie-----	25	High Texture/slope/ surface layer thickness	Low
3340:			
Seanna-----	35	High Texture/slope/ surface layer thickness/rock fragments	Low
Grubstake, moist----	20	Low	Low
Pinecity-----	15	High Texture/slope/ surface layer thickness	Low
3345:			
Bigcanyon-----	55	High Texture/slope/ surface layer thickness	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
3345: Bigcanyon, cool-----	20	High Texture/slope/ surface layer thickness	Low
3440: Pacific Mesa, steep-	65	High Texture/slope/ surface layer thickness/rock fragments	Moderate Soil reaction
Pacific Mesa-----	30	Moderate Texture/surface layer thickness/rock fragments	Moderate Soil reaction
3509: Cajon, very rarely flooded-----	60	High Texture/surface layer thickness/rock fragments	Low
Friedliver-----	20	High Texture/surface layer thickness/rock fragments	Low
3525: Cajon-----	70	High Texture/surface layer thickness/rock fragments	Low
Friedliver-----	15	High Texture/surface layer thickness/rock fragments	Low
3526: Cajon-----	40	High Texture/surface layer thickness/rock fragments	Low
Hypoint-----	35	High Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
3526: Arizo, occasionally flooded-----	15	High Texture/surface layer thickness/rock fragments	Low
3611: Burntshack, sand surface-----	50	High Texture/surface layer thickness/rock fragments	Low
Burntshack-----	35	High Texture/surface layer thickness/rock fragments	Low
3612: Burntshack-----	75	High Texture/surface layer thickness/rock fragments	Low
Burntshack, occasionally flooded-----	20	High Texture/surface layer thickness/rock fragments	Low
3676: Morongo, loamy sand, very rarely flooded-----	80	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction
3677: Morongo-----	80	High Texture/surface layer thickness/rock fragments	Low
3679: Morongo, cool-----	55	High Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
3679: Jumborox-----	20	High Texture/surface layer thickness/rock fragments	Low
3680: Morongo-----	85	High Texture/surface layer thickness/rock fragments	Low
3681: Morongo, very rarely flooded-----	45	High Texture/surface layer thickness/rock fragments	Low
Jumborox, dry-----	35	High Texture/surface layer thickness/rock fragments	Low
3682: Morongo, cool-----	50	High Texture/surface layer thickness/rock fragments	Low
Jumborox-----	15	High Texture/surface layer thickness/rock fragments	Low
Urban land-----	15	Not rated	Not rated
3683: Morongo-----	55	High Texture/surface layer thickness/rock fragments	Low
Bluecut, very rarely flooded-----	30	Moderate Texture/surface layer thickness/rock fragments	Low
3684: Morongo, warm-----	85	High Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
3685: Morongo, cool-----	65	High Texture/surface layer thickness/rock fragments	Low
Desertqueen, Undulating-----	15	High Texture/surface layer thickness/rock fragments	Low
3690: Nasagold-----	85	High Texture/surface layer thickness/rock fragments	Low
3695: Gocougs-----	80	High Texture/surface layer thickness/rock fragments	Low
4031: Crosgrain-----	50	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction
Crackerjack-----	30	High Texture/surface layer thickness/rock fragments	Moderate Soil reaction
Pinkcan, dry-----	15	High Texture/surface layer thickness/rock fragments	Low
4041: Silvermine-----	40	High Texture/surface layer thickness/rock fragments	Low
Helendale-----	30	Moderate Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
4041: Burntshack, very rarely flooded-----	20	High Texture/surface layer thickness/rock fragments	Low
4064: Gravesumit-----	55	High Texture/surface layer thickness/rock fragments	Low
Helendale, sandy surface-----	35	High Texture/rock fragments	Low
4071: Helendale-----	65	Moderate Texture/surface layer thickness/rock fragments	Low
Desertqueen, very rarely flooded-----	15	Moderate Texture/surface layer thickness/rock fragments	Low
4091: Littlefargo-----	85	High Texture/surface layer thickness/rock fragments	Low
4245: Bluecut-----	40	High Texture/surface layer thickness/rock fragments	Low
Morongo, very rarely flooded-----	25	High Texture/surface layer thickness/rock fragments	Low
Yander, very rarely flooded-----	15	High Texture/surface layer thickness/rock fragments	Low



# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
4260: Minhoyt-----	45	Moderate Texture/surface layer thickness/rock fragments	Moderate Carbonate content Soil reaction
		0.50	0.50
Corbilt, rarely flooded-----	40	High Texture/rock fragments	Low
		1.00	
4265: Werewolf, warm-----	80	Moderate Texture/surface layer thickness/rock fragments	Low
		0.50	
4270: Yuccabutte, extremely cobbly sandy loam-----	95	High Texture/surface layer thickness/rock fragments	Low
		1.00	
4271: Yuccabutte, warm----	60	Moderate Texture/surface layer thickness/rock fragments	Low
		0.50	
Arizo, rarely flooded-----	30	High Texture/surface layer thickness/rock fragments	Low
		1.00	
4275: Pinkcan-----	35	Moderate Texture/surface layer thickness/rock fragments	Low
		0.50	
Werewolf-----	25	High Texture/surface layer thickness/rock fragments	Low
		1.00	
Gocougs, warm-----	15	Moderate Texture/surface layer thickness/rock fragments	Low
		0.50	

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality		
		Rating class and limiting features	Value	Rating class and limiting features	Value
4280: Mekkadale-----	55	Moderate Texture/surface layer thickness/rock fragments	0.50	Low	
Edalph, warm-----	25	High Texture/slope/ surface layer thickness/rock fragments	1.00	Moderate Soil reaction	0.50
4285: Typic Argidurids----	35	High Texture/slope/ rock fragments/ surface layer thickness	1.00	Moderate Soil reaction	0.50
Coppermine-----	30	Moderate Texture/surface layer thickness/rock fragments	0.50	Low	
Minhoyt, warm-----	25	Moderate Texture/surface layer thickness/rock fragments	0.50	Moderate Soil reaction	0.50
4403: Arizo, rarely flooded, channeled-	50	High Texture/rock fragments	1.00	Low	
Arizo, rarely flooded-----	25	High Texture/rock fragments	1.00	Low	
Arizo-----	20	High Texture/surface layer thickness/rock fragments	1.00	Low	
4440: Dragonwash, occasionally flooded-----	55	High Texture/surface layer thickness/rock fragments	1.00	Low	

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
4440: Dragonwash, frequently flooded-----	35	High Texture/surface layer thickness/rock fragments	Low
4450: Morongo, occasionally flooded-----	75	High Texture/rock fragments	Low
Morongo, frequently flooded-----	15	High Texture/surface layer thickness/rock fragments	Low
4605: Pinecity, moist-----	80	High Texture/surface layer thickness/rock fragments	Low
4606: Pinecity-----	60	High Texture/surface layer thickness/rock fragments	Low
Rock outcrop-----	25	Not rated	Not rated
4607: Pinecity-----	85	High Texture/surface layer thickness/rock fragments	Low
4608: Pinecity-----	60	High Texture/surface layer thickness/rock fragments	Low
Rock outcrop-----	30	Not rated	Not rated
4610: Desertqueen-----	35	Moderate Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.--Land Management, Part IV (Site Restoration)--Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
4610: Jumborox, warm-----	25	High Texture/surface layer thickness/rock fragments	Low
Rock outcrop-----	20	Not rated	Not rated
4615: Desertqueen, cool---	45	Moderate Texture/surface layer thickness/rock fragments	Low
Jumborox-----	25	High Texture/surface layer thickness/rock fragments	Low
Rock outcrop-----	15	Not rated	Not rated
4620: Stranger-----	40	High Texture/slope/ surface layer thickness	Low
Rock outcrop-----	35	Not rated	Not rated
Grubstake, moist----	20	High Texture/surface layer thickness/rock fragments	Low
4625: Grinder-----	50	Moderate Texture/surface layer thickness/rock fragments	Low
Grinder, cool-----	20	Moderate Texture/surface layer thickness/rock fragments	Low
Pinkcan, cool-----	15	Moderate Texture/surface layer thickness/rock fragments	Low
4630: Thunderclap-----	50	High Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features
4630: Smithcanyon-----	30	High Texture/surface layer thickness/rock fragments	Low
4804: Rock outcrop-----	45	Not rated	Not rated
Ironped-----	25	High Texture/slope/ surface layer thickness	Low
Pinecity-----	20	High Texture/slope/ surface layer thickness	Low
4805: Rock outcrop-----	50	Not rated	Not rated
Ironped, cool-----	30	High Texture/surface layer thickness/rock fragments	Low
4806: Rock outcrop-----	90	Not rated	Not rated
4811: Rock outcrop-----	85	Not rated	Not rated
Pioneertown-----	10	High Texture/slope/ surface layer thickness	Low
4825: Rock outcrop-----	30	Not rated	Not rated
Grubstake-----	20	High Texture/surface layer thickness/rock fragments	Low
Cajon, rarely flooded-----	20	High Texture/surface layer thickness/rock fragments	Low
Stranger, warm-----	15	High Texture/surface layer thickness/rock fragments	Low

# Soil Survey of Joshua Tree National Park, California

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire	Value	Potential for seedling mortality	Value
		Rating class and limiting features		Rating class and limiting features	
4830:					
Rock outcrop-----	80	Not rated		Not rated	
Pinecity, cool-----	10	High		Low	
		Texture/surface layer	1.00		
		thickness/rock fragments			
4900:					
Rock outcrop-----	65	Not rated		Not rated	
Aguilareal-----	15	Low		Low	
Lostpalms-----	15	High		Low	
		Texture/slope/ surface layer	1.00		
		thickness			

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1220:					
Jadestorm-----	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	1.00	Gravel content	1.00
		Large stones content	1.00	Large stones content	1.00
		Too sandy	0.82	Too sandy	0.82
Blackeagle, cool----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.60	Too sandy	0.60
		Large stones content	0.19	Large stones content	0.19
Rock outcrop-----	10	Not rated		Not rated	
1225:					
Blackeagle-----	65	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.19	Large stones content	0.19
		Too sandy	0.12	Too sandy	0.12
Rock outcrop-----	15	Not rated		Not rated	
1230:					
Jadestorm-----	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	1.00	Gravel content	1.00
		Large stones content	1.00	Large stones content	1.00
		Too sandy	0.02	Too sandy	0.02
Jadestorm, cool----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	1.00	Gravel content	1.00
		Large stones content	1.00	Large stones content	1.00
		Too sandy	0.02	Too sandy	0.02
Rock outcrop-----	15	Not rated		Not rated	



# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1240:					
Meccapass-----	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel	1.00	Gravel content	1.00
		Too sandy	0.40	Too sandy	0.40
		Dusty	0.16	Dusty	0.16
Bulletproof-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel	0.99	Gravel content	0.99
		Too sandy	0.96	Too sandy	0.96
Rock outcrop-----	10	Not rated		Not rated	
1241:					
Meccapass-----	45	Very limited		Very limited	
		Slope	1.00	Large stones	1.00
		Large stones content	1.00	content	
		Gravel	1.00	Slope	1.00
		Dusty	0.17	Gravel content	1.00
				Dusty	0.17
Seanna-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.76	Large stones content	0.76
		Gravel	0.16	Gravel content	0.16
Contactmine, dry----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
		Dusty	0.16	Dusty	0.16
		Gravel	0.01	Gravel content	0.01
1242:					
Meccapass-----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel	1.00	Gravel content	1.00
		Dusty	0.18	Dusty	0.18
Jadestorm-----	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	1.00	Gravel content	1.00
		Large stones content	1.00	Large stones content	1.00
		Too sandy	0.02	Too sandy	0.02
Rock outcrop-----	15	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1250:					
Ironlung-----	50	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Slope	1.00
		Too sandy	1.00	Depth to bedrock	1.00
		Gravel	0.21	Gravel content	0.21
Ironlung, cool-----	20	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Slope	1.00
		Too sandy	1.00	Depth to bedrock	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel	0.21	Gravel content	0.21
Rock outcrop-----	15	Not rated		Not rated	
1255:					
Goldenhills-----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel	0.99	Gravel content	0.99
		Too sandy	0.88	Too sandy	0.88
Bulletproof-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.99	Gravel content	0.99
		Too sandy	0.96	Too sandy	0.96
		Large stones content	0.23	Large stones content	0.23
Fanhill-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Large stones content	1.00	Large stones content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.18	Too sandy	0.18
Whiterobe-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.76	Large stones content	0.76
1260:					
Whiterobe-----	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.76	Large stones content	0.76
Bigbernie-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.76	Large stones content	0.76
		Gravel	0.30	Gravel content	0.30

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1260: Whiterobe, cool-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.76	Large stones content	0.76
1410: Missionwell-----	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.50	Too sandy	0.50
		Dusty	0.06	Dusty	0.06
Rock outcrop-----	20	Not rated		Not rated	
Missionwell, high elevation-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.12	Dusty	0.12
1415: Bolero-----	60	Very limited		Very limited	
		Slope	1.00	Large stones content	1.00
		Large stones content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.88	Too sandy	0.88
		Gravel	0.71	Gravel content	0.71
Rock outcrop-----	20	Not rated		Not rated	
1504: Rizzo, rarely flooded, stony-----	50	Very limited		Very limited	
		Flooding	1.00	Large stones content	1.00
		Large stones content	1.00	Too sandy	0.50
		Too sandy	0.50	Slope	0.04
		Slope	0.04		
Rizzo, occasionally flooded, stony-----	35	Very limited		Very limited	
		Flooding	1.00	Large stones content	1.00
		Large stones content	1.00	Too sandy	0.76
		Too sandy	0.76	Slope	0.63
		Slope	0.63		
1510: Carrizo, very gravelly sandy loam	85	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Large stones content	0.19	Large stones content	0.19
		Too sandy	0.18	Too sandy	0.18

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1511: Carrizo, channeled--	75	Very limited Flooding Too sandy	1.00 0.60	Somewhat limited Too sandy	0.60
Carrizo, occasionally flooded-----	15	Very limited Flooding Gravel Too sandy	1.00 1.00 0.96	Very limited Gravel content Too sandy	1.00 0.96
1512: Carrizo, extremely gravelly sandy loam	80	Somewhat limited Gravel Too sandy Large stones content	0.98 0.40 0.01	Somewhat limited Gravel content Too sandy Large stones content	0.98 0.40 0.01
1513: Carrizo-----	60	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
Carrizo, occasionally flooded, channeled-	20	Very limited Flooding Gravel Large stones content Too sandy	1.00 1.00 1.00 0.88	Very limited Large stones content Gravel content Too sandy	1.00 1.00 0.88
Rubylee-----	15	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
1514: Carrizo, rarely flooded-----	40	Very limited Flooding Too sandy Gravel	1.00 0.50 0.36	Somewhat limited Too sandy Gravel content	0.50 0.36
Pintobasin, fine sandy loam-----	30	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
Rubylee-----	15	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
1515: Pintobasin-----	80	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1515: Carrizo, occasionally flooded-----	15	Very limited Flooding Gravel Too sandy	1.00 1.00 0.96	Very limited Gravel content Too sandy	1.00 0.96
1516: Pintobasin, fine sandy loam-----	90	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
1517: Pintobasin-----	65	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Dalelake-----	25	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1520: Pintobasin, loamy sand-----	80	Very limited Flooding Too sandy	1.00 0.24	Somewhat limited Too sandy	0.24
1522: Pintobasin, rarely flooded-----	85	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
1523: Pintobasin, rarely flooded-----	50	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
Aquapeak-----	25	Very limited Depth to cemented pan Too sandy Gravel	1.00 1.00 1.00	Very limited Too sandy Depth to cemented pan Gravel content	1.00 1.00 1.00
Pintobasin, occasionally flooded-----	20	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
1524: Pintobasin, rarely flooded-----	90	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
1525: Pintobasin, occasionally flooded-----	45	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1525: Pintobasin, rarely flooded-----	35	Very limited Flooding Too sandy	1.00 0.24	Somewhat limited Too sandy	0.24
1526: Pintobasin, rarely flooded-----	55	Very limited Flooding Too sandy	1.00 0.88	Somewhat limited Too sandy	0.88
Joetree-----	20	Very limited Flooding Too sandy	1.00 0.50	Somewhat limited Too sandy	0.50
Patscamp-----	15	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
1527: Pintobasin, moist---	90	Somewhat limited Slope Too sandy	0.37 0.24	Somewhat limited Slope Too sandy	0.37 0.24
1530: Dalelake, fine sand-	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1531: Dalelake-----	60	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Pintobasin, rarely flooded-----	30	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
1540: Carrizo, very rarely flooded----	35	Very limited Flooding Gravel Large stones content Too sandy	1.00 1.00 1.00 0.18	Very limited Gravel content Large stones content Too sandy	1.00 1.00 0.18
Carrizo, stable----	25	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
Carrizo, occasionally flooded, rocky surface-----	20	Very limited Flooding Large stones content Too sandy Gravel	1.00 1.00 0.50 0.36	Very limited Large stones content Too sandy Gravel content	1.00 0.50 0.36

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1540: Russioks-----	20	Very limited Gravel Slow water movement Dusty	1.00 0.15 0.09	Very limited Gravel content Slow water movement Dusty	1.00 0.15 0.09
1541: Carrizo, stable-----	50	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
Cambidic Haplodurids	40	Very limited Gravel Depth to cemented pan	1.00 1.00	Very limited Gravel content Depth to cemented pan	1.00 1.00
1542: Carrizo, very rarely flooded-----	70	Very limited Flooding Large stones content Too sandy	1.00 1.00 0.04	Very limited Large stones content Too sandy	1.00 0.04
Carrizo, occasionally flooded-----	20	Very limited Flooding Gravel Large stones content Too sandy	1.00 1.00 1.00 0.96	Very limited Gravel content Large stones content Too sandy	1.00 1.00 0.96
1550: Buzzardsprings, stable-----	35	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
Coxpin-----	25	Very limited Depth to cemented pan Too sandy	1.00 0.50	Very limited Depth to cemented pan Too sandy	1.00 0.50
Dalelake-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1555: Goldrose-----	35	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Carsitas, very rarely flooded-----	30	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
Chemwash, rarely flooded-----	25	Very limited Flooding Too sandy Gravel	1.00 0.88 0.05	Somewhat limited Too sandy Gravel content	0.88 0.05



# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2003:					
Emptygun-----	100	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Too sandy	0.12	Too sandy	0.12
2060:					
Joetree, very rarely flooded-----	35	Very limited		Somewhat limited	
		Flooding	1.00	Too sandy	0.88
		Too sandy	0.88		
Dalelake-----	30	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Pintobasin, fine sandy loam-----	25	Somewhat limited		Somewhat limited	
		Too sandy	0.12	Too sandy	0.12
2065:					
Dalelake-----	30	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Aquapeak-----	25	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Large stones content	0.76	Large stones content	0.76
		Dusty	0.03	Dusty	0.03
Coxpin-----	25	Very limited		Very limited	
		Depth to cemented pan	1.00	Too sandy	1.00
		Too sandy	1.00	Depth to cemented pan	1.00
		Large stones content	0.19	Large stones content	0.19
2067:					
Aquapeak, overblown-	30	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Dusty	0.16	Dusty	0.16
Buzzardsprings-----	25	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Dalelake, thick sandy surface-----	20	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Buzzardsprings, steep-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.50	Too sandy	0.50
		Gravel	0.38	Gravel content	0.38

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2068:					
Aquapeak-----	45	Very limited		Very limited	
		Depth to	1.00	Too sandy	1.00
		cemented pan		Depth to	1.00
		Too sandy	1.00	cemented pan	
		Gravel	1.00	Gravel content	1.00
		Large stones	0.76	Large stones	0.76
		content		content	
Carpetflat, nongravelly surface	35	Very limited		Very limited	
		Depth to	1.00	Too sandy	1.00
		cemented pan		Depth to	1.00
		Too sandy	1.00	cemented pan	
		Gravel	0.74	Gravel content	0.74
Pintobasin-----	15	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
2070:					
Missionsweet-----	60	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Depth to	1.00	Depth to	1.00
		cemented pan		cemented pan	
		Slope	0.84	Slope	0.84
		Dusty	0.24	Dusty	0.24
		Large stones	0.19	Large stones	0.19
		content		content	
Carpetflat-----	25	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Depth to	1.00	Depth to	1.00
		cemented pan		cemented pan	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slow water	0.15	Slow water	0.15
		movement		movement	
		Dusty	0.12	Dusty	0.12
2075:					
Oldale-----	50	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Dusty	0.27	Dusty	0.27
		Slow water	0.15	Slow water	0.15
		movement		movement	
Missionsweet-----	30	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Depth to	1.00	Depth to	1.00
		cemented pan		cemented pan	
		Slope	0.84	Slope	0.84
		Dusty	0.24	Dusty	0.24
		Large stones	0.19	Large stones	0.19
		content		content	
2076:					
Oldale-----	40	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Dusty	0.27	Dusty	0.27
		Slow water	0.15	Slow water	0.15
		movement		movement	

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2076: Carrizo-----	30	Very limited Gravel Large stones content Too sandy	1.00 0.19 0.18	Very limited Gravel content Large stones content Too sandy	1.00 0.19 0.18
2077: Oldale-----	50	Very limited Gravel Slow water movement Dusty	1.00 0.15 0.15	Very limited Gravel content Slow water movement Dusty	1.00 0.15 0.15
Carrizo-----	25	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
Carrizo, very rarely flooded-----	15	Very limited Flooding Gravel Large stones content Too sandy	1.00 1.00 1.00 0.18	Very limited Gravel content Large stones content Too sandy	1.00 1.00 0.18
2085: Rainbowsend-----	45	Very limited Depth to cemented pan Slope Large stones content Too sandy	1.00 1.00 1.00 0.88	Very limited Depth to cemented pan Large stones content Slope Too sandy	1.00 1.00 1.00 0.88
Goldenbell-----	35	Very limited Gravel Depth to cemented pan Dusty	1.00 1.00 0.10	Very limited Gravel content Depth to cemented pan Dusty	1.00 1.00 0.10
2090: Deprave-----	35	Very limited Gravel Large stones content Dusty	1.00 0.19 0.08	Very limited Gravel content Large stones content Dusty	1.00 0.19 0.08
Rockhound-----	25	Very limited Gravel Dusty Large stones content	1.00 0.24 0.19	Very limited Gravel content Dusty Large stones content	1.00 0.24 0.19
Rizzo-----	20	Very limited Large stones content Gravel Too sandy	1.00 0.92 0.12	Very limited Large stones content Gravel content Too sandy	1.00 0.92 0.12

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2091:					
Deprave-----	60	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Depth to cemented pan	0.92	Depth to cemented pan	0.92
		Large stones content	0.19	Large stones content	0.19
		Dusty	0.03	Dusty	0.03
Roostertail-----	15	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Dusty	0.03	Dusty	0.03
2100:					
Perurose-----	50	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Too sandy	0.88	Too sandy	0.88
		Depth to cemented pan	0.46	Depth to cemented pan	0.46
Coxpin-----	25	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
Pintobasin, gravelly surface---	15	Somewhat limited		Somewhat limited	
		Too sandy	0.24	Too sandy	0.24
2101:					
Perurose, rarely flooded-----	60	Very limited		Very limited	
		Flooding	1.00	Too sandy	1.00
		Too sandy	1.00	Depth to	0.65
		Depth to cemented pan	0.65	cemented pan	
Pintobasin, rarely flooded-----	35	Very limited		Very limited	
		Flooding	1.00	Too sandy	1.00
		Too sandy	1.00		
2110:					
Descent-----	80	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.12	Large stones content	0.12
Descent, stable-----	15	Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00
		Large stones content	0.23	Large stones content	0.23
2111:					
Descent, warm-----	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.12	Large stones content	0.12

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2111: Rubylee, very rarely flooded-----	40	Very limited Large stones content Slope Too sandy	1.00 0.63 0.12	Very limited Large stones content Slope Too sandy	1.00 0.63 0.12
2120: Rizzo, rarely flooded-----	35	Very limited Flooding Large stones content Too sandy	1.00 1.00 0.50	Very limited Large stones content Too sandy	1.00 0.50
Deprave-----	35	Very limited Gravel Depth to cemented pan Large stones content Dusty	1.00 0.23 0.19 0.03	Very limited Gravel content Depth to cemented pan Large stones content Dusty	1.00 0.23 0.19 0.03
Rizzo, frequently flooded-----	20	Very limited Flooding Too sandy Gravel	1.00 1.00 0.26	Very limited Too sandy Flooding Gravel content	1.00 0.40 0.26
2121: Rizzo, rubbly-----	90	Very limited Large stones content Too sandy Gravel	1.00 0.12 0.11	Very limited Large stones content Too sandy Gravel content	1.00 0.12 0.11
2130: Goldenbell-----	55	Very limited Gravel Depth to cemented pan Dusty	1.00 1.00 0.31	Very limited Gravel content Depth to cemented pan Dusty	1.00 1.00 0.31
Descent-----	40	Somewhat limited Too sandy Slope	0.88 0.63	Somewhat limited Too sandy Slope	0.88 0.63
2140: Rockhound, cobbly---	85	Very limited Gravel Large stones content Slow water movement Dusty	1.00 0.19 0.15 0.06	Very limited Gravel content Large stones content Slow water movement Dusty	1.00 0.19 0.15 0.06

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2402: Rizzo-----	70	Very limited Large stones content Too sandy	1.00 0.76	Very limited Large stones content Too sandy	1.00 0.76
Rizzo, frequently flooded-----	20	Very limited Flooding Too sandy Gravel Large stones content	1.00 1.00 1.00 1.00	Very limited Too sandy Gravel content Large stones content Flooding	1.00 1.00 1.00 0.40
2403: Rizzo-----	80	Very limited Large stones content Gravel	1.00 0.73	Very limited Large stones content Gravel content	1.00 0.73
Rizzo, occasionally flooded-----	15	Very limited Flooding Too sandy Large stones content Gravel	1.00 1.00 1.00 0.26	Very limited Too sandy Large stones content Gravel content	1.00 1.00 0.26
2404: Rizzo, occasionally flooded-----	60	Very limited Flooding Large stones content Too sandy	1.00 0.76 0.76	Somewhat limited Large stones content Too sandy	0.76 0.76
Rizzo, very rarely flooded-----	35	Very limited Flooding Large stones content Too sandy	1.00 0.76 0.50	Somewhat limited Large stones content Too sandy	0.76 0.50
2405: Carrizo, rarely flooded-----	65	Very limited Flooding Too sandy Gravel	1.00 0.50 0.36	Somewhat limited Too sandy Gravel content	0.50 0.36
Carrizo, occasionally flooded-----	25	Very limited Flooding Gravel Too sandy Large stones content	1.00 1.00 0.96 0.19	Very limited Gravel content Too sandy Large stones content	1.00 0.96 0.19

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2406: Pintobasin, frequently flooded-----	50	Very limited Flooding Too sandy Gravel	 1.00 1.00 0.05	Very limited Too sandy Flooding Gravel content	 1.00 0.40 0.05
Carrizo, occasionally flooded-----	40	Very limited Flooding Gravel Too sandy	 1.00 1.00 0.96	Very limited Gravel content Too sandy	 1.00 0.96
2407: Pintobasin, rarely flooded-----	45	Very limited Flooding Too sandy	 1.00 1.00	Very limited Too sandy	 1.00
Carrizo, occasionally flooded-----	30	Very limited Flooding Gravel Too sandy	 1.00 1.00 0.96	Very limited Gravel content Too sandy	 1.00 0.96
Carrizo, frequently flooded-----	20	Very limited Flooding Too sandy	 1.00 1.00	Very limited Too sandy Flooding	 1.00 0.40
2408: Rizzo, frequently flooded-----	55	Very limited Flooding Too sandy Gravel	 1.00 1.00 0.26	Very limited Too sandy Flooding Gravel content	 1.00 0.40 0.26
Rizzo, very rarely flooded-----	35	Very limited Flooding Large stones content Too sandy	 1.00 1.00 0.76	Very limited Large stones content Too sandy	 1.00 0.76
2409: Rizzo, frequently flooded-----	35	Very limited Flooding Large stones content Too sandy Gravel	 1.00 1.00 0.88 0.38	Very limited Large stones content Too sandy Flooding Gravel content	 1.00 0.88 0.40 0.38
Chemwash, frequently flooded-----	30	Very limited Flooding Too sandy Gravel	 1.00 1.00 1.00	Very limited Too sandy Gravel content Flooding	 1.00 1.00 0.40



# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2409: Carsitas, occasionally flooded, braided---	25	Very limited Flooding Too sandy	1.00 0.88	Somewhat limited Too sandy	0.88
2420: Carsitas, frequently flooded-	45	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy Flooding	1.00 0.40
Carsitas, occasionally flooded-----	40	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
Carsitas, rarely flooded-----	15	Very limited Flooding Too sandy	1.00 0.12	Somewhat limited Too sandy	0.12
2421: Carsitas, very rarely flooded-----	55	Very limited Flooding Too sandy	1.00 0.50	Somewhat limited Too sandy	0.50
Carsitas, rarely flooded-----	25	Very limited Flooding Too sandy	1.00 0.12	Somewhat limited Too sandy	0.12
2431: Chemwash, frequently flooded, braided---	60	Very limited Flooding Too sandy Gravel Large stones content	1.00 1.00 1.00 0.19	Very limited Too sandy Gravel content Flooding Large stones content	1.00 1.00 0.40 0.19
Chemwash, frequently flooded-	25	Very limited Flooding Too sandy Gravel Large stones content	1.00 1.00 1.00 0.19	Very limited Too sandy Gravel content Flooding Large stones content	1.00 1.00 0.40 0.19
2440: Rizzo-----	35	Very limited Large stones content Too sandy Gravel Slope	1.00 0.88 0.38 0.16	Very limited Large stones content Too sandy Gravel content Slope	1.00 0.88 0.38 0.16

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2440:					
Rizzo, occasionally flooded-----	30	Very limited Flooding Too sandy Gravel Large stones content	1.00 1.00 1.00 1.00	Very limited Too sandy Gravel content Large stones content	1.00 1.00 1.00
Rizzo, extremely stony-----	15	Very limited Large stones content Gravel Slope Too sandy	1.00 0.92 0.63 0.12	Very limited Large stones content Gravel content Slope Too sandy	1.00 0.92 0.63 0.12
2715:					
Dalelake-----	35	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Sheephole-----	30	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Pintobasin-----	25	Very limited Too sandy	1.00	Very limited Too sandy	1.00
2716:					
Dalelake, steep-----	75	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Dalelake-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
2717:					
Dalelake-----	40	Very limited Too sandy Slope	1.00 0.16	Very limited Too sandy Slope	1.00 0.16
Rock outcrop-----	25	Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
2718:					
Dalelake-----	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Sheephole, gravelly surface-----	45	Very limited Too sandy	1.00	Very limited Too sandy	1.00
2820:					
Rock outcrop-----	60	Not rated		Not rated	
Impedimenta-----	25	Very limited Depth to bedrock Slope Too sandy Gravel	1.00 1.00 0.88 0.38	Very limited Depth to bedrock Slope Too sandy Gravel content	1.00 1.00 0.88 0.38

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2825:					
Rock outcrop-----	35	Not rated		Not rated	
Supplymine-----	25	Very limited		Very limited	
		Slope	1.00	Large stones	1.00
		Large stones	1.00	content	
		content		Slope	1.00
		Too sandy	0.88	Too sandy	0.88
		Gravel	0.82	Gravel content	0.82
Bolero, dry-----	15	Very limited		Very limited	
		Slope	1.00	Large stones	1.00
		Large stones	1.00	content	
		content		Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.88	Too sandy	0.88
		Gravel	0.86	Gravel content	0.86
Ironage-----	15	Very limited		Very limited	
		Slope	1.00	Large stones	1.00
		Large stones	1.00	content	
		content		Slope	1.00
		Gravel	0.81	Gravel content	0.81
		Too sandy	0.12	Too sandy	0.12
2830:					
Rock outcrop-----	80	Not rated		Not rated	
Blackeagle, cool----	10	Very limited		Very limited	
		Slope	1.00	Large stones	1.00
		Large stones	1.00	content	
		content		Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.12	Too sandy	0.12
2835:					
Rock outcrop-----	40	Not rated		Not rated	
Blackeagle-----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones	0.19	Large stones	0.19
		content		content	
		Too sandy	0.12	Too sandy	0.12
2840:					
Rock outcrop-----	65	Not rated		Not rated	
Jadestorm-----	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	1.00	Gravel content	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.02	Too sandy	0.02

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3110: Coppermine, cool----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	1.00	Large stones content	1.00
		Too sandy	0.12	Too sandy	0.12
		Dusty	0.05	Dusty	0.05
Stranger-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.96	Slope	0.96
		Too sandy	0.40	Too sandy	0.40
		Gravel	0.05	Gravel content	0.05
3120: Aguilareal-----	40	Very limited		Very limited	
		Slope	1.00	Large stones content	1.00
		Large stones content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.92	Gravel content	0.92
		Too sandy	0.50	Too sandy	0.50
Blackeagle-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.19	Large stones content	0.19
		Too sandy	0.12	Too sandy	0.12
Rock outcrop-----	15	Not rated		Not rated	
3213: Dalvord-----	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	1.00	Gravel content	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.76	Large stones content	0.76
Aguilareal-----	30	Very limited		Very limited	
		Slope	1.00	Large stones content	1.00
		Large stones content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.92	Gravel content	0.92
		Too sandy	0.50	Too sandy	0.50
Rock outcrop-----	25	Not rated		Not rated	
3242: Langwell-----	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00
		Gravel	0.84	Gravel content	0.84
		Too sandy	0.32	Too sandy	0.32
Rock outcrop-----	25	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3242: Helendale, cool-----	20	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
3285: Pinecity-----	30	Very limited Slope Depth to bedrock Too sandy Large stones content Gravel	1.00 1.00 0.88 0.76 0.38	Very limited Slope Depth to bedrock Too sandy Large stones content Gravel content	1.00 1.00 0.88 0.76 0.38
Contactmine-----	20	Very limited Slope Large stones content Dusty	1.00 0.76 0.18	Very limited Slope Large stones content Dusty	1.00 0.76 0.18
Desertqueen-----	20	Very limited Slope Large stones content Depth to bedrock Too sandy	1.00 1.00 1.00 0.12	Very limited Large stones content Slope Depth to bedrock Too sandy	1.00 1.00 1.00 0.12
Rock outcrop-----	15	Not rated		Not rated	
3286: Pinecity, gravelly loamy sand-----	85	Very limited Slope Large stones content Depth to bedrock Too sandy Gravel	1.00 1.00 1.00 0.40 0.38	Very limited Large stones content Slope Depth to bedrock Too sandy Gravel content	1.00 1.00 1.00 0.40 0.38
3291: Smithcanyon-----	40	Very limited Slope Depth to bedrock Too sandy Large stones content	1.00 1.00 0.50 0.19	Very limited Slope Depth to bedrock Too sandy Large stones content	1.00 1.00 0.50 0.19
Stubbespring-----	25	Very limited Slope Large stones content Depth to bedrock Too sandy Dusty	1.00 1.00 1.00 1.00 0.01	Very limited Large stones content Too sandy Slope Depth to bedrock Dusty	1.00 1.00 1.00 1.00 0.01
Rock outcrop-----	20	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3292: Smithcanyon-----	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.76	Large stones content	0.76
Pinecity-----	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	1.00	Large stones content	1.00
		Too sandy	0.88	Too sandy	0.88
		Gravel	0.05	Gravel content	0.05
Rock outcrop-----	25	Not rated		Not rated	
3293: Smithcanyon-----	50	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Slope	1.00
		Too sandy	1.00	Depth to bedrock	1.00
		Large stones content	0.19	Large stones content	0.19
Pinecity-----	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.88	Too sandy	0.88
		Gravel	0.05	Gravel content	0.05
3294: Smithcanyon, dry----	80	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Slope	1.00
		Too sandy	1.00	Depth to bedrock	1.00
		Gravel	0.05	Gravel content	0.05
3295: Desertqueen, dry----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	1.00	Large stones content	1.00
		Too sandy	0.12	Too sandy	0.12
Hexie-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00
		Large stones content	1.00	Large stones content	1.00
Rock outcrop-----	20	Not rated		Not rated	
3296: Desertqueen-----	45	Very limited		Very limited	
		Slope	1.00	Large stones content	1.00
		Large stones content	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Slope	1.00
		Too sandy	1.00	Depth to bedrock	1.00

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3296: Pinecity-----	35	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Slope	1.00
		Too sandy	1.00	Depth to bedrock	1.00
		Large stones content	1.00	Large stones content	1.00
3297: Desertqueen, warm---	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.12	Too sandy	0.12
Contactmine, dry----	20	Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00
		Slope	1.00	Large stones	1.00
		Large stones content	1.00	content	
		Dusty	0.29	Slope	1.00
		Gravel	0.01	Dusty	0.29
				Gravel content	0.01
Seanna, dry-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones content	0.76	Large stones content	0.76
		Gravel	0.16	Gravel content	0.16
		Dusty	0.07	Dusty	0.07
3325: Ironped, warm-----	30	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Slope	1.00
		Too sandy	1.00	Depth to bedrock	1.00
		Large stones content	1.00	Large stones content	1.00
Rock outcrop-----	20	Not rated		Not rated	
Hexie-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.76	Large stones content	0.76
		Dusty	0.01	Dusty	0.01
Ironped-----	15	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Slope	1.00
		Too sandy	1.00	Depth to bedrock	1.00
3335: Xeric Torriorthents-	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
Rock outcrop-----	25	Not rated		Not rated	



# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3335: Xeric Torriorthents, warm	25	Very limited Slope Too sandy	1.00 0.88	Very limited Slope Too sandy	1.00 0.88
3336: Xeric Torriorthents-	45	Very limited Slope Too sandy	1.00 0.88	Very limited Slope Too sandy	1.00 0.88
Bigbernie-----	25	Very limited Slope Too sandy Large stones content Gravel	1.00 0.88 0.76 0.30	Very limited Slope Too sandy Large stones content Gravel content	1.00 0.88 0.76 0.30
3340: Seanna-----	35	Very limited Slope Depth to bedrock Large stones content Dusty Too sandy	1.00 1.00 1.00 0.06 0.02	Very limited Slope Depth to bedrock Large stones content Dusty Too sandy	1.00 1.00 1.00 0.06 0.02
Grubstake, moist----	20	Very limited Slope Gravel Large stones content Depth to bedrock Dusty	1.00 1.00 1.00 1.00 0.04	Very limited Slope Gravel content Large stones content Depth to bedrock Dusty	1.00 1.00 1.00 1.00 0.04
Pinecity-----	15	Very limited Slope Depth to bedrock Large stones content Too sandy	1.00 1.00 1.00 0.50	Very limited Slope Depth to bedrock Large stones content Too sandy	1.00 1.00 1.00 0.50
3345: Bigcanyon-----	55	Very limited Slope Too sandy Large stones content	1.00 1.00 0.19	Very limited Too sandy Slope Large stones content	1.00 1.00 0.19
Bigcanyon, cool----	20	Very limited Slope Too sandy Large stones content	1.00 1.00 0.19	Very limited Too sandy Slope Large stones content	1.00 1.00 0.19
3440: Pacific Mesa, steep-	65	Very limited Slope Large stones content Depth to bedrock Gravel Dusty	1.00 1.00 1.00 0.28 0.15	Very limited Large stones content Slope Depth to bedrock Gravel content Dusty	1.00 1.00 1.00 1.00 0.28 0.15

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3440: Pacific Mesa-----	30	Very limited Large stones content Depth to bedrock Dusty Slow water movement	1.00 1.00 0.17 0.15	Very limited Large stones content Depth to bedrock Dusty Slow water movement	1.00 1.00 0.17 0.15
3509: Cajon, very rarely flooded-----	60	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
Friedliver-----	20	Very limited Gravel Too sandy	1.00 0.82	Very limited Gravel content Too sandy	1.00 0.82
3525: Cajon-----	70	Very limited Flooding Too sandy Gravel	1.00 1.00 0.74	Very limited Too sandy Gravel content	1.00 0.74
Friedliver-----	15	Very limited Flooding Too sandy Gravel	1.00 1.00 0.32	Very limited Too sandy Gravel content	1.00 0.32
3526: Cajon-----	40	Very limited Flooding Too sandy Gravel	1.00 0.50 0.32	Somewhat limited Too sandy Gravel content	0.50 0.32
Hypoint-----	35	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Arizo, occasionally flooded-----	15	Very limited Flooding Too sandy Gravel	1.00 1.00 0.26	Very limited Too sandy Gravel content	1.00 0.26
3611: Burntshack, sand surface-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Burntshack-----	35	Somewhat limited Too sandy	0.98	Somewhat limited Too sandy	0.98
3612: Burntshack-----	75	Somewhat limited Too sandy	0.98	Somewhat limited Too sandy	0.98
Burntshack, occasionally flooded-----	20	Very limited Flooding Too sandy Gravel	1.00 0.98 0.74	Somewhat limited Too sandy Gravel content	0.98 0.74

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3676: Morongo, loamy sand, very rarely flooded-----	80	Very limited Flooding Too sandy	1.00 0.88	Somewhat limited Too sandy	0.88
3677: Morongo-----	80	Very limited Too sandy	1.00	Very limited Too sandy	1.00
3679: Morongo, cool-----	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Jumborox-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
3680: Morongo-----	85	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
3681: Morongo, very rarely flooded-----	45	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
Jumborox, dry-----	35	Very limited Too sandy	1.00	Very limited Too sandy	1.00
3682: Morongo, cool-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Jumborox-----	15	Somewhat limited Too sandy	0.76	Somewhat limited Too sandy	0.76
Urban land-----	15	Not rated		Not rated	
3683: Morongo-----	55	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Bluecut, very rarely flooded-----	30	Somewhat limited Too sandy Dusty	0.08 0.02	Somewhat limited Too sandy Dusty	0.08 0.02
3684: Morongo, warm-----	85	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
3685: Morongo, cool-----	65	Very limited Too sandy Slope	1.00 0.63	Very limited Too sandy Slope	1.00 0.63
Desertqueen, undulating-----	15	Very limited Depth to bedrock Slope Too sandy	1.00 1.00 0.50	Very limited Depth to bedrock Slope Too sandy	1.00 1.00 0.50

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3690: Nasagold-----	85	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
3695: Gocougs-----	80	Somewhat limited Too sandy Depth to cemented pan Dusty	0.50 0.20 0.11	Somewhat limited Too sandy Depth to cemented pan Dusty	0.50 0.20 0.11
4031: Crosgrain-----	50	Very limited Depth to cemented pan Slope Gravel Too sandy	1.00 1.00 0.40 0.12	Very limited Depth to cemented pan Slope Gravel content Too sandy	1.00 1.00 0.40 0.12
Crackerjack-----	30	Very limited Depth to cemented pan Slope Dusty Gravel	1.00 1.00 0.19 0.08	Very limited Depth to cemented pan Slope Dusty Gravel content	1.00 1.00 0.19 0.08
Pinkcan, dry-----	15	Somewhat limited Large stones content Dusty	0.76 0.03	Somewhat limited Large stones content Dusty	0.76 0.03
4041: Silvermine-----	40	Very limited Depth to cemented pan Too sandy	1.00 0.50	Very limited Depth to cemented pan Too sandy	1.00 0.50
Helendale-----	30	Somewhat limited Dusty	0.03	Somewhat limited Dusty	0.03
Burntshack, very rarely flooded-----	20	Very limited Flooding Too sandy	1.00 0.98	Somewhat limited Too sandy	0.98
4064: Gravesumit-----	55	Somewhat limited Too sandy	0.76	Somewhat limited Too sandy	0.76
Helendale, sandy surface-----	35	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
4071: Helendale-----	65	Somewhat limited Dusty	0.01	Somewhat limited Dusty	0.01
Desertqueen, very rarely flooded-----	15	Very limited Depth to bedrock Slope Too sandy	1.00 0.63 0.12	Very limited Depth to bedrock Slope Too sandy	1.00 0.63 0.12

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4091: Littlefargo-----	85	Somewhat limited		Somewhat limited	
		Too sandy	0.82	Too sandy	0.82
		Slope	0.16	Slope	0.16
4245: Bluecut-----	40	Somewhat limited		Somewhat limited	
		Too sandy	0.88	Too sandy	0.88
Morongo, very rarely flooded----	25	Very limited		Very limited	
		Flooding	1.00	Too sandy	1.00
		Too sandy	1.00		
Yander, very rarely flooded-----	15	Very limited		Somewhat limited	
		Flooding	1.00	Too sandy	0.50
		Too sandy	0.50		
4260: Minhoyt-----	45	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
Corbilt, rarely flooded-----	40	Very limited		Very limited	
		Flooding	1.00	Too sandy	1.00
		Too sandy	1.00		
4265: Werewolf, warm-----	80	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Gravel	0.11	Gravel content	0.11
		Dusty	0.10	Dusty	0.10
4270: Yuccabutte, extremely cobbly sandy loam-----	95	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	1.00	Slow water movement	1.00
		Dusty	0.39	Dusty	0.39
		Gravel	0.31	Gravel content	0.31
4271: Yuccabutte, warm----	60	Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00
		Large stones content	0.19	Large stones content	0.19
		Dusty	0.16	Dusty	0.16
Arizo, rarely flooded-----	30	Very limited		Somewhat limited	
		Flooding	1.00	Too sandy	0.88
		Too sandy	0.88		

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4275:					
Pinkcan-----	35	Somewhat limited Dusty	0.05	Somewhat limited Dusty	0.05
Werewolf-----	25	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Gocougs, warm-----	15	Very limited Slow water movement Dusty Depth to cemented pan	1.00 0.14 0.14	Very limited Slow water movement Dusty Depth to cemented pan	1.00 0.14 0.14
4280:					
Mekkadale-----	55	Very limited Depth to cemented pan Slope Dusty	1.00 1.00 0.22	Very limited Depth to cemented pan Slope Dusty	1.00 1.00 0.22
Edalph, warm-----	25	Very limited Slope	1.00	Very limited Slope	1.00
4285:					
Typic Argidurids----	35	Very limited Gravel Slow water movement Slope Depth to cemented pan Dusty	1.00 1.00 1.00 0.94 0.32	Very limited Gravel content Slow water movement Slope Depth to cemented pan Dusty	1.00 1.00 1.00 0.94 0.32
Coppermine-----	30	Very limited Depth to bedrock Slope Dusty	1.00 1.00 0.09	Very limited Depth to bedrock Slope Dusty	1.00 1.00 0.09
Minhoyt, warm-----	25	Very limited Depth to cemented pan Slope Dusty	1.00 0.63 0.19	Very limited Depth to cemented pan Slope Dusty	1.00 0.63 0.19
4403:					
Arizo, rarely flooded, channeled-	50	Very limited Flooding Too sandy Large stones content Gravel	1.00 1.00 0.76 0.29	Very limited Too sandy Large stones content Gravel content	1.00 0.76 0.29
Arizo, rarely flooded-----	25	Very limited Flooding Too sandy Large stones content Gravel	1.00 1.00 0.76 0.29	Very limited Too sandy Large stones content Gravel content	1.00 0.76 0.29

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4403: Arizo-----	20	Somewhat limited Large stones content	0.76	Somewhat limited Large stones content	0.76
4440: Dragonwash, occasionally flooded-----	55	Very limited Flooding Too sandy	1.00 0.88	Somewhat limited Too sandy	0.88
Dragonwash, frequently flooded-	35	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy Flooding	1.00 0.40
4450: Morongo, occasionally flooded-----	75	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00
Morongo, frequently flooded-----	15	Very limited Flooding Too sandy Large stones content	1.00 1.00 0.19	Very limited Too sandy Flooding Large stones content	1.00 0.40 0.19
4605: Pinecity, moist----	80	Very limited Depth to bedrock Too sandy	1.00 0.88	Very limited Depth to bedrock Too sandy	1.00 0.88
4606: Pinecity-----	60	Very limited Depth to bedrock Slope Too sandy Gravel	1.00 1.00 0.92 0.05	Very limited Depth to bedrock Slope Too sandy Gravel content	1.00 1.00 0.92 0.05
Rock outcrop-----	25	Not rated		Not rated	
4607: Pinecity-----	85	Very limited Depth to bedrock Too sandy Large stones content	1.00 1.00 1.00	Very limited Too sandy Depth to bedrock Large stones content	1.00 1.00 1.00
4608: Pinecity-----	60	Very limited Depth to bedrock Large stones content Too sandy	1.00 1.00 0.88	Very limited Depth to bedrock Large stones content Too sandy	1.00 1.00 0.88
Rock outcrop-----	30	Not rated		Not rated	



# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4610: Desertqueen-----	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.12	Too sandy	0.12
Jumborox, warm-----	25	Somewhat limited		Somewhat limited	
		Too sandy	0.88	Too sandy	0.88
Rock outcrop-----	20	Not rated		Not rated	
4615: Desertqueen, cool---	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.12	Too sandy	0.12
		Dusty	0.01	Dusty	0.01
Jumborox-----	25	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Rock outcrop-----	15	Not rated		Not rated	
4620: Stranger-----	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.50	Too sandy	0.50
Rock outcrop-----	35	Not rated		Not rated	
Grubstake, moist----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.88	Too sandy	0.88
4625: Grinder-----	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.11	Gravel content	0.11
Grinder, cool-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00
		Gravel	0.54	Gravel content	0.54
		Dusty	0.01	Dusty	0.01
Pinkcan, cool-----	15	Somewhat limited		Somewhat limited	
		Large stones	0.76	Large stones	0.76
		content		content	
		Dusty	0.03	Dusty	0.03
4630: Thunderclap-----	50	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Smithcanyon-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.88	Too sandy	0.88
		Slope	0.16	Slope	0.16

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4804:					
Rock outcrop-----	45	Not rated		Not rated	
Ironped-----	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.40	Too sandy	0.40
		Gravel	0.05	Gravel content	0.05
Pinecity-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	1.00	Large stones content	1.00
		Too sandy	0.92	Too sandy	0.92
		Gravel	0.05	Gravel content	0.05
4805:					
Rock outcrop-----	50	Not rated		Not rated	
Ironped, cool-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.40	Too sandy	0.40
		Gravel	0.05	Gravel content	0.05
4806:					
Rock outcrop-----	90	Not rated		Not rated	
4811:					
Rock outcrop-----	85	Not rated		Not rated	
Pioneertown-----	10	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Depth to bedrock	1.00	Slope	1.00
		Too sandy	1.00	Depth to bedrock	1.00
		Gravel	0.84	Gravel content	0.84
4825:					
Rock outcrop-----	30	Not rated		Not rated	
Grubstake-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.88	Too sandy	0.88
Cajon, rarely flooded-----	20	Very limited		Very limited	
		Flooding	1.00	Too sandy	1.00
		Too sandy	1.00		
Stranger, warm-----	15	Very limited		Very limited	
		Depth to bedrock	1.00	Too sandy	1.00
		Too sandy	1.00	Depth to bedrock	1.00

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4830:					
Rock outcrop-----	80	Not rated		Not rated	
Pinecity, cool-----	10	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.92	Too sandy	0.92
		Gravel	0.05	Gravel content	0.05
4900:					
Rock outcrop-----	65	Not rated		Not rated	
Aguilareal-----	15	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.92	Gravel content	0.92
		Too sandy	0.50	Too sandy	0.50
Lostpalms-----	15	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1220:					
Jadestorm-----	60	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Too sandy	0.82
		Too sandy	0.82	Slope	0.44
Blackeagle, cool----	20	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.60	Too sandy	0.60
		Large stones	0.19	Large stones	0.19
		content		content	
Rock outcrop-----	10	Not rated		Not rated	
1225:					
Blackeagle-----	65	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	0.19	Large stones	0.19
		content		content	
		Too sandy	0.12	Too sandy	0.12
Rock outcrop-----	15	Not rated		Not rated	
1230:					
Jadestorm-----	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Gravel	1.00	Gravel	1.00
		Too sandy	0.02	Too sandy	0.02
Jadestorm, cool----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.02	Too sandy	0.02
Rock outcrop-----	15	Not rated		Not rated	
1240:					
Meccapass-----	45	Very limited		Very limited	
		Slope	1.00	Large stones	1.00
		Large stones	1.00	content	
		content		Gravel	1.00
		Gravel	1.00	Slope	0.96
		Too sandy	0.40	Too sandy	0.40
Bulletproof-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.96	Too sandy	0.96
Rock outcrop-----	10	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
1241:					
Meccapass-----	45	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	1.00
Seanna-----	20	Very limited		Somewhat limited	
		Slope	1.00	Large stones	0.76
		Large stones	0.76	content	
		content		Slope	0.44
Contactmine, dry----	20	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Slope	0.96
1242:					
Meccapass-----	40	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	1.00
Jadestorm-----	25	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.02	Too sandy	0.02
Rock outcrop-----	15	Not rated		Not rated	
1250:					
Ironlung-----	50	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00
Ironlung, cool-----	20	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
Rock outcrop-----	15	Not rated		Not rated	
1255:					
Goldenhills-----	40	Very limited		Very limited	
		Slope	1.00	Large stones	1.00
		Large stones	1.00	content	
		content		Slope	1.00
		Too sandy	0.88	Too sandy	0.88
Bulletproof-----	15	Very limited		Somewhat limited	
		Slope	1.00	Too sandy	0.96
		Too sandy	0.96	Slope	0.92
		Large stones	0.23	Large stones	0.23
		content		content	

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1255:					
Fanhill-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.18	Too sandy	0.18
Whiterobe-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones	0.76	Large stones	0.76
		content		content	
1260:					
Whiterobe-----	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones	0.76	Large stones	0.76
		content		content	
Bigbernie-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones	0.76	Large stones	0.76
		content		content	
Whiterobe, cool-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones	0.76	Large stones	0.76
		content		content	
1410:					
Missionwell-----	50	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	0.68
		Too sandy	0.50	Too sandy	0.50
Rock outcrop-----	20	Not rated		Not rated	
Missionwell, high elevation-----	15	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	0.50		
1415:					
Bolero-----	60	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
Rock outcrop-----	20	Not rated		Not rated	
1504:					
Rizzo, rarely flooded, stony-----	50	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Water erosion	1.00	Water erosion	1.00
		Too sandy	0.50	Too sandy	0.50

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1504: Rizzo, occasionally flooded, stony-----	35	Very limited Large stones content Too sandy	1.00 0.76	Very limited Large stones content Too sandy	1.00 0.76
1510: Carrizo, very gravelly sandy loam	85	Somewhat limited Large stones content Too sandy	0.19 0.18	Somewhat limited Large stones content Too sandy	0.19 0.18
1511: Carrizo, channeled--	75	Somewhat limited Too sandy	0.60	Somewhat limited Too sandy	0.60
Carrizo, occasionally flooded-----	15	Somewhat limited Too sandy	0.96	Somewhat limited Too sandy	0.96
1512: Carrizo, extremely gravelly sandy loam	80	Somewhat limited Too sandy Large stones content	0.40 0.01	Somewhat limited Too sandy Large stones content	0.40 0.01
1513: Carrizo-----	60	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
Carrizo, occasionally flooded, channeled-	20	Very limited Large stones content Too sandy	1.00 0.88	Very limited Large stones content Too sandy	1.00 0.88
Rubylee-----	15	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
1514: Carrizo, rarely flooded-----	40	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
Pintobasin, fine sandy loam-----	30	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
Rubylee-----	15	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12



# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
1515: Pintobasin-----	80	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Carrizo, occasionally flooded-----	15	Somewhat limited Too sandy	0.96	Somewhat limited Too sandy	0.96
1516: Pintobasin, fine sandy loam-----	90	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
1517: Pintobasin-----	65	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Dalelake-----	25	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1520: Pintobasin, loamy sand-----	80	Somewhat limited Too sandy	0.24	Somewhat limited Too sandy	0.24
1522: Pintobasin, rarely flooded-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1523: Pintobasin, rarely flooded-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Aquapeak-----	25	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Pintobasin, occasionally flooded-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1524: Pintobasin, rarely flooded-----	90	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1525: Pintobasin, occasionally flooded-----	45	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Pintobasin, rarely flooded-----	35	Somewhat limited Too sandy	0.24	Somewhat limited Too sandy	0.24

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
1526: Pintobasin, rarely flooded-----	55	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Joetree-----	20	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
Patscamp-----	15	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
1527: Pintobasin, moist---	90	Somewhat limited Too sandy	0.24	Somewhat limited Too sandy	0.24
1530: Dalelake, fine sand-	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1531: Dalelake-----	60	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Pintobasin, rarely flooded-----	30	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1540: Carrizo, very rarely flooded----	35	Very limited Large stones content Too sandy	1.00 0.18	Very limited Large stones content Too sandy	1.00 0.18
Carrizo, stable----	25	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
Carrizo, occasionally flooded, rocky surface-----	20	Very limited Large stones content Too sandy	1.00 0.50	Very limited Large stones content Too sandy	1.00 0.50
Russiroks-----	20	Very limited Gravel	1.00	Very limited Gravel	1.00
1541: Carrizo, stable----	50	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
Cambidic Haplodurids	40	Very limited Gravel	1.00	Very limited Gravel	1.00

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1542: Carrizo, very rarely flooded-----	70	Very limited Large stones content Too sandy	1.00 0.04	Very limited Large stones content Too sandy	1.00 0.04
Carrizo, occasionally flooded-----	20	Very limited Large stones content Too sandy	1.00 0.96	Very limited Large stones content Too sandy	1.00 0.96
1550: Buzzardsprings, stable-----	35	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
Coxpin-----	25	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
Dalelake-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
1555: Goldrose-----	35	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Carsitas, very rarely flooded-----	30	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Chemwash, rarely flooded-----	25	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
2003: Emptygun-----	100	Very limited Slope Too sandy	1.00 0.12	Somewhat limited Slope Too sandy	0.56 0.12
2060: Joetree, very rarely flooded-----	35	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Dalelake-----	30	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Pintobasin, fine sandy loam-----	25	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
2065: Dalelake-----	30	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Aquapeak-----	25	Very limited Gravel Large stones content	1.00 0.76	Very limited Gravel Large stones content	1.00 0.76

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
2065: Coxpin-----	25	Very limited Too sandy Large stones content	1.00 0.19	Very limited Too sandy Large stones content	1.00 0.19
2067: Aquapeak, overblown-	30	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50
Buzzardsprings-----	25	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Dalelake, thick sandy surface-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Buzzardsprings, steep-----	15	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
2068: Aquapeak-----	45	Very limited Too sandy Large stones content	1.00 0.76	Very limited Too sandy Large stones content	1.00 0.76
Carpetflat, nongravelly surface	35	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Pintobasin-----	15	Very limited Too sandy	1.00	Very limited Too sandy	1.00
2070: Missionsweet-----	60	Very limited Gravel Large stones content	1.00 0.19	Very limited Gravel Large stones content	1.00 0.19
Carpetflat-----	25	Very limited Large stones content Gravel	1.00 1.00	Very limited Large stones content Gravel	1.00 1.00
2075: Oldale-----	50	Very limited Gravel	1.00	Very limited Gravel	1.00
Missionsweet-----	30	Very limited Gravel Large stones content	1.00 0.19	Very limited Gravel Large stones content	1.00 0.19
2076: Oldale-----	40	Very limited Large stones content Gravel	1.00 1.00	Very limited Large stones content Gravel	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
2076: Carrizo-----	30	Somewhat limited		Somewhat limited	
		Large stones	0.19	Large stones	0.19
		content		content	
		Too sandy	0.18	Too sandy	0.18
2077: Oldale-----	50	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
Carrizo-----	25	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.12	Too sandy	0.12
Carrizo, very rarely flooded-----	15	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.18	Too sandy	0.18
2085: Rainbowsend-----	45	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Slope	0.92
		Too sandy	0.88	Too sandy	0.88
Goldenbell-----	35	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
2090: Deprave-----	35	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Large stones	0.19	Large stones	0.19
		content		content	
Rockhound-----	25	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Dusty	0.50	Dusty	0.50
		Large stones	0.19	Large stones	0.19
		content		content	
Rizzo-----	20	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.12	Too sandy	0.12
2091: Deprave-----	60	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Large stones	0.19	Large stones	0.19
		content		content	
Roostertail-----	15	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
2100: Perurose-----	50	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Too sandy	0.88	Too sandy	0.88

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
2100: Coxpin-----	25	Not limited		Not limited	
Pintobasin, gravelly surface---	15	Somewhat limited Too sandy	0.24	Somewhat limited Too sandy	0.24
2101: Perurose, rarely flooded-----	60	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Pintobasin, rarely flooded-----	35	Very limited Too sandy	1.00	Very limited Too sandy	1.00
2110: Descent-----	80	Very limited Slope Too sandy Large stones content	1.00 0.88 0.12	Somewhat limited Slope Too sandy Large stones content	0.92 0.88 0.12
Descent, stable----	15	Somewhat limited Large stones content	0.23	Somewhat limited Large stones content	0.23
2111: Descent, warm-----	45	Very limited Slope Too sandy Large stones content	1.00 0.88 0.12	Somewhat limited Slope Too sandy Large stones content	0.92 0.88 0.12
Rubylee, very rarely flooded----	40	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
2120: Rizzo, rarely flooded-----	35	Very limited Large stones content Too sandy	1.00 0.50	Very limited Large stones content Too sandy	1.00 0.50
Deprave-----	35	Very limited Gravel Large stones content	1.00 0.19	Very limited Gravel Large stones content	1.00 0.19
Rizzo, frequently flooded-----	20	Very limited Too sandy Flooding	1.00 0.40	Very limited Too sandy Flooding	1.00 0.40
2121: Rizzo, rubbly-----	90	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2130: Goldenbell-----	55	Very limited Gravel	1.00	Very limited Gravel	1.00
Descent-----	40	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
2140: Rockhound, cobbly---	85	Very limited Gravel	1.00	Very limited Gravel	1.00
		Dusty	0.50	Dusty	0.50
		Large stones content	0.19	Large stones content	0.19
2402: Rizzo-----	70	Very limited Large stones content	1.00	Very limited Large stones content	1.00
		Too sandy	0.76	Too sandy	0.76
Rizzo, frequently flooded-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
		Large stones content	1.00	Large stones content	1.00
		Flooding	0.40	Flooding	0.40
2403: Rizzo-----	80	Very limited Large stones content	1.00	Very limited Large stones content	1.00
Rizzo, occasionally flooded-----	15	Very limited Too sandy	1.00	Very limited Too sandy	1.00
		Large stones content	1.00	Large stones content	1.00
2404: Rizzo, occasionally flooded-----	60	Somewhat limited Large stones content	0.76	Somewhat limited Large stones content	0.76
		Too sandy	0.76	Too sandy	0.76
Rizzo, very rarely flooded-----	35	Somewhat limited Large stones content	0.76	Somewhat limited Large stones content	0.76
		Too sandy	0.50	Too sandy	0.50
2405: Carrizo, rarely flooded-----	65	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
Carrizo, occasionally flooded-----	25	Somewhat limited Too sandy	0.96	Somewhat limited Too sandy	0.96
		Large stones content	0.19	Large stones content	0.19



# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
2406: Pintobasin, frequently flooded	50	Very limited Too sandy Flooding	1.00 0.40	Very limited Too sandy Flooding	1.00 0.40
Carrizo, occasionally flooded-----	40	Somewhat limited Too sandy	0.96	Somewhat limited Too sandy	0.96
2407: Pintobasin, rarely flooded-----	45	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Carrizo, occasionally flooded-----	30	Somewhat limited Too sandy	0.96	Somewhat limited Too sandy	0.96
Carrizo, frequently flooded-----	20	Very limited Too sandy Flooding	1.00 0.40	Very limited Too sandy Flooding	1.00 0.40
2408: Rizzo, frequently flooded-----	55	Very limited Too sandy Flooding	1.00 0.40	Very limited Too sandy Flooding	1.00 0.40
Rizzo, very rarely flooded-----	35	Very limited Large stones content Too sandy	1.00 0.76	Very limited Large stones content Too sandy	1.00 0.76
2409: Rizzo, frequently flooded-----	35	Very limited Large stones content Too sandy Flooding	1.00 0.88 0.40	Very limited Large stones content Too sandy Flooding	1.00 0.88 0.40
Chemwash, frequently flooded-	30	Very limited Too sandy Flooding	1.00 0.40	Very limited Too sandy Flooding	1.00 0.40
Carsitas, occasionally flooded, braided---	25	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
2420: Carsitas, frequently flooded-	45	Very limited Too sandy Flooding	1.00 0.40	Very limited Too sandy Flooding	1.00 0.40

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2420: Carsitas, occasionally flooded-----	40	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Carsitas, rarely flooded-----	15	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
2421: Carsitas, very rarely flooded-----	55	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
Carsitas, rarely flooded-----	25	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
2431: Chemwash, frequently flooded, braided---	60	Very limited Too sandy Flooding Large stones content	1.00 0.40 0.19	Very limited Too sandy Flooding Large stones content	1.00 0.40 0.19
Chemwash, frequently flooded-	25	Very limited Too sandy Flooding Large stones content	1.00 0.40 0.19	Very limited Too sandy Flooding Large stones content	1.00 0.40 0.19
2440: Rizzo-----	35	Very limited Large stones content Too sandy	1.00 0.88	Very limited Large stones content Too sandy	1.00 0.88
Rizzo, occasionally flooded-----	30	Very limited Too sandy Large stones content	1.00 1.00	Very limited Too sandy Large stones content	1.00 1.00
Rizzo, extremely stony-----	15	Very limited Large stones content Too sandy	1.00 0.12	Very limited Large stones content Too sandy	1.00 0.12
2715: Dalelake-----	35	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Sheephole-----	30	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Pintobasin-----	25	Very limited Too sandy	1.00	Very limited Too sandy	1.00

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
2716:					
Dalelake, steep-----	75	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Dalelake-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
2717:					
Dalelake-----	40	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Rock outcrop-----	25	Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
2718:					
Dalelake-----	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Sheephole, gravelly surface-----	45	Very limited Too sandy	1.00	Very limited Too sandy	1.00
2820:					
Rock outcrop-----	60	Not rated		Not rated	
Impedimenta-----	25	Somewhat limited Too sandy Slope	0.88 0.02	Somewhat limited Too sandy	0.88
2825:					
Rock outcrop-----	35	Not rated		Not rated	
Supplymine-----	25	Very limited Large stones content Slope Too sandy	1.00 1.00 0.88	Very limited Large stones content Too sandy Slope	1.00 0.88 0.44
Bolero, dry-----	15	Very limited Large stones content Slope Too sandy	1.00 1.00 0.88	Very limited Large stones content Slope Too sandy	1.00 1.00 0.88
Ironage-----	15	Very limited Large stones content Slope Too sandy	1.00 1.00 0.12	Very limited Large stones content Slope Too sandy	1.00 1.00 0.12
2830:					
Rock outcrop-----	80	Not rated		Not rated	
Blackeagle, cool-----	10	Very limited Large stones content Slope Too sandy	1.00 1.00 0.12	Very limited Large stones content Slope Too sandy	1.00 1.00 0.12

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
2835:					
Rock outcrop-----	40	Not rated		Not rated	
Blackeagle-----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	0.19	Large stones	0.19
		content		content	
		Too sandy	0.12	Too sandy	0.12
2840:					
Rock outcrop-----	65	Not rated		Not rated	
Jadestorm-----	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	0.02	Too sandy	0.02
3110:					
Coppermine, cool----	40	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Too sandy	0.12
		Too sandy	0.12		
Stranger-----	30	Somewhat limited		Somewhat limited	
		Too sandy	0.40	Too sandy	0.40
3120:					
Aguilareal-----	40	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Slope	1.00
		Too sandy	0.50	Too sandy	0.50
Blackeagle-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	0.19	Large stones	0.19
		content		content	
		Too sandy	0.12	Too sandy	0.12
Rock outcrop-----	15	Not rated		Not rated	
3213:					
Dalvord-----	35	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	0.98	Too sandy	0.88
		Too sandy	0.88	Large stones	0.76
		Large stones	0.76	content	
		content			
Aguilareal-----	30	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Slope	1.00
		Too sandy	0.50	Too sandy	0.50
Rock outcrop-----	25	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
3242:					
Langwell-----	50	Somewhat limited		Somewhat limited	
		Slope	0.98	Too sandy	0.32
		Too sandy	0.32		
Rock outcrop-----	25	Not rated		Not rated	
Helendale, cool-----	20	Somewhat limited		Somewhat limited	
		Too sandy	0.50	Too sandy	0.50
3285:					
Pinecity-----	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.76	Large stones content	0.76
Contactmine-----	20	Very limited		Somewhat limited	
		Slope	1.00	Large stones content	0.76
		Large stones content	0.76	Slope	0.32
Desertqueen-----	20	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	0.68	Too sandy	0.12
		Too sandy	0.12		
Rock outcrop-----	15	Not rated		Not rated	
3286:					
Pinecity, gravelly loamy sand-----	85	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.40	Too sandy	0.40
3291:					
Smithcanyon-----	40	Somewhat limited		Somewhat limited	
		Too sandy	0.50	Too sandy	0.50
		Large stones content	0.19	Large stones content	0.19
		Slope	0.18		
Stubbespring-----	25	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Too sandy	1.00	Too sandy	1.00
		Slope	1.00	Slope	1.00
Rock outcrop-----	20	Not rated		Not rated	
3292:					
Smithcanyon-----	35	Somewhat limited		Somewhat limited	
		Too sandy	0.88	Too sandy	0.88
		Large stones content	0.76	Large stones content	0.76
		Slope	0.08		

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
3292:					
Pinecity-----	25	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Slope	0.92
		Too sandy	0.88	Too sandy	0.88
Rock outcrop-----	25	Not rated		Not rated	
3293:					
Smithcanyon-----	50	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Slope	1.00	Slope	0.78
		Large stones	0.19	Large stones	0.19
		content		content	
Pinecity-----	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88
3294:					
Smithcanyon, dry----	80	Very limited		Very limited	
		Slope	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00
3295:					
Desertqueen, dry----	40	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Too sandy	0.12
		Too sandy	0.12		
Hexie-----	20	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Slope	0.86
Rock outcrop-----	20	Not rated		Not rated	
3296:					
Desertqueen-----	45	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Too sandy	1.00	Too sandy	1.00
		Slope	0.18		
Pinecity-----	35	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	0.08		
3297:					
Desertqueen, warm----	40	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	0.32	Too sandy	0.12
		Too sandy	0.12		
Contactmine, dry----	20	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	0.18		

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
3297: Seanna, dry-----	20	Very limited Slope Large stones content	1.00 0.76	Somewhat limited Large stones content Slope	0.76 0.22
3325: Ironped, warm-----	30	Very limited Slope Too sandy Large stones content	1.00 1.00 1.00	Very limited Too sandy Large stones content Slope	1.00 1.00 0.22
Rock outcrop-----	20	Not rated		Not rated	
Hexie-----	15	Very limited Slope Large stones content	1.00 0.76	Very limited Slope Large stones content	1.00 0.76
Ironped-----	15	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
3335: Xeric Torriorthents-	40	Very limited Slope Too sandy	1.00 0.88	Very limited Slope Too sandy	1.00 0.88
Rock outcrop-----	25	Not rated		Not rated	
Xeric Torriorthents, warm	25	Very limited Slope Too sandy	1.00 0.88	Very limited Slope Too sandy	1.00 0.88
3336: Xeric Torriorthents-	45	Very limited Slope Too sandy	1.00 0.88	Very limited Slope Too sandy	1.00 0.88
Bigbernie-----	25	Very limited Slope Too sandy Large stones content	1.00 0.88 0.76	Very limited Slope Too sandy Large stones content	1.00 0.88 0.76
3340: Seanna-----	35	Very limited Slope Large stones content Too sandy	1.00 1.00 0.02	Very limited Large stones content Slope Too sandy	1.00 0.92 0.02
Grubstake, moist----	20	Very limited Gravel Slope Large stones content Too sandy	1.00 1.00 1.00 0.02	Very limited Gravel Large stones content Slope Too sandy	1.00 1.00 1.00 0.02



# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3340: Pinecity-----	15	Very limited Slope Large stones content Too sandy	 1.00 1.00  0.50	Very limited Slope Large stones content Too sandy	 1.00 1.00  0.50
3345: Bigcanyon-----	55	Very limited Slope Too sandy Large stones content	 1.00 1.00 0.19	Very limited Too sandy Slope Large stones content	 1.00 1.00 0.19
Bigcanyon, cool-----	20	Very limited Slope Too sandy Large stones content	 1.00 1.00 0.19	Very limited Too sandy Slope Large stones content	 1.00 1.00 0.19
3440: Pacific Mesa, steep-	65	Very limited Large stones content Slope	 1.00  1.00	Very limited Large stones content Slope	 1.00  1.00
Pacific Mesa-----	30	Very limited Large stones content Dusty	 1.00  0.50	Very limited Large stones content Dusty	 1.00  0.50
3509: Cajon, very rarely flooded-----	60	Very limited Too sandy	 1.00	Very limited Too sandy	 1.00
Friedliver-----	20	Somewhat limited Too sandy	 0.82	Somewhat limited Too sandy	 0.82
3525: Cajon-----	70	Very limited Too sandy	 1.00	Very limited Too sandy	 1.00
Friedliver-----	15	Very limited Too sandy	 1.00	Very limited Too sandy	 1.00
3526: Cajon-----	40	Somewhat limited Too sandy	 0.50	Somewhat limited Too sandy	 0.50
Hypoint-----	35	Somewhat limited Too sandy	 0.88	Somewhat limited Too sandy	 0.88
Arizo, occasionally flooded-----	15	Very limited Too sandy	 1.00	Very limited Too sandy	 1.00
3611: Burntshack, sand surface-----	50	Very limited Too sandy	 1.00	Very limited Too sandy	 1.00

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
3611: Burntshack-----	35	Somewhat limited Too sandy	0.98	Somewhat limited Too sandy	0.98
3612: Burntshack-----	75	Somewhat limited Too sandy	0.98	Somewhat limited Too sandy	0.98
Burntshack, occasionally flooded-----	20	Somewhat limited Too sandy	0.98	Somewhat limited Too sandy	0.98
3676: Morongo, loamy sand, very rarely flooded-----	80	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
3677: Morongo-----	80	Very limited Too sandy	1.00	Very limited Too sandy	1.00
3679: Morongo, cool-----	55	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Jumborox-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
3680: Morongo-----	85	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
3681: Morongo, very rarely flooded-----	45	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Jumborox, dry-----	35	Very limited Too sandy	1.00	Very limited Too sandy	1.00
3682: Morongo, cool-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Jumborox-----	15	Somewhat limited Too sandy	0.76	Somewhat limited Too sandy	0.76
Urban land-----	15	Not rated		Not rated	
3683: Morongo-----	55	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Bluecut, very rarely flooded-----	30	Somewhat limited Too sandy	0.08	Somewhat limited Too sandy	0.08
3684: Morongo, warm-----	85	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3685: Morongo, cool-----	65	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Desertqueen, undulating-----	15	Very limited Slope Too sandy	1.00 0.50	Somewhat limited Too sandy Slope	0.50 0.01
3690: Nasagold-----	85	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
3695: Gocougs-----	80	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
4031: Crosgrain-----	50	Somewhat limited Too sandy Slope	0.12 0.02	Somewhat limited Too sandy	0.12
Crackerjack-----	30	Somewhat limited Slope	0.08	Not limited	
Pinkcan, dry-----	15	Somewhat limited Large stones content	0.76	Somewhat limited Large stones content	0.76
4041: Silvermine-----	40	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
Helendale-----	30	Not limited		Not limited	
Burntshack, very rarely flooded-----	20	Somewhat limited Too sandy	0.98	Somewhat limited Too sandy	0.98
4064: Gravesumit-----	55	Somewhat limited Too sandy	0.76	Somewhat limited Too sandy	0.76
Helendale, sandy surface-----	35	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
4071: Helendale-----	65	Not limited		Not limited	
Desertqueen, very rarely flooded-----	15	Somewhat limited Too sandy	0.12	Somewhat limited Too sandy	0.12
4091: Littlefargo-----	85	Somewhat limited Too sandy	0.82	Somewhat limited Too sandy	0.82

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
4245: Bluecut-----	40	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Morongo, very rarely flooded-----	25	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Yander, very rarely flooded-----	15	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50
4260: Minhoyt-----	45	Not limited		Not limited	
Corbilt, rarely flooded-----	40	Very limited Too sandy	1.00	Very limited Too sandy	1.00
4265: Werewolf, warm-----	80	Very limited Large stones content	1.00	Very limited Large stones content	1.00
4270: Yuccabutte, extremely cobbly sandy loam-----	95	Very limited Large stones content Slope Dusty	1.00 0.98 0.50	Very limited Large stones content Dusty	1.00 0.50
4271: Yuccabutte, warm----	60	Somewhat limited Dusty Large stones content	0.50 0.19	Somewhat limited Dusty Large stones content	0.50 0.19
Arizo, rarely flooded-----	30	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
4275: Pinkcan-----	35	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50
Werewolf-----	25	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Gocougs, warm-----	15	Not limited		Not limited	
4280: Mekkadale-----	55	Very limited Water erosion Dusty Slope	1.00 0.50 0.02	Very limited Water erosion Dusty	1.00 0.50
Edalph, warm-----	25	Very limited Slope	1.00	Somewhat limited Slope	0.22

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
4285:					
Typic Argidurids----	35	Very limited Gravel Slope	1.00 0.02	Very limited Gravel	1.00
Coppermine-----	30	Very limited Slope	1.00	Not limited	
Minhoys, warm-----	25	Very limited Water erosion	1.00	Very limited Water erosion	1.00
4403:					
Arizo, rarely flooded, channeled-	50	Very limited Too sandy Large stones content	1.00 0.76	Very limited Too sandy Large stones content	1.00 0.76
Arizo, rarely flooded-----	25	Very limited Too sandy Large stones content	1.00 0.76	Very limited Too sandy Large stones content	1.00 0.76
Arizo-----	20	Somewhat limited Large stones content	0.76	Somewhat limited Large stones content	0.76
4440:					
Dragonwash, occasionally flooded-----	55	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Dragonwash, frequently flooded-	35	Very limited Too sandy Flooding	1.00 0.40	Very limited Too sandy Flooding	1.00 0.40
4450:					
Morongo, occasionally flooded-----	75	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Morongo, frequently flooded-----	15	Very limited Too sandy Flooding Large stones content	1.00 0.40 0.19	Very limited Too sandy Flooding Large stones content	1.00 0.40 0.19
4605:					
Pinecity, moist----	80	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
4606:					
Pinecity-----	60	Somewhat limited Too sandy	0.92	Somewhat limited Too sandy	0.92
Rock outcrop-----	25	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
4607: Pinecity-----	85	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
		Large stones content	1.00	Large stones content	1.00
4608: Pinecity-----	60	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Too sandy	0.88	Too sandy	0.88
Rock outcrop-----	30	Not rated		Not rated	
4610: Desertqueen-----	35	Somewhat limited		Somewhat limited	
		Too sandy	0.12	Too sandy	0.12
Jumborox, warm-----	25	Somewhat limited		Somewhat limited	
		Too sandy	0.88	Too sandy	0.88
Rock outcrop-----	20	Not rated		Not rated	
4615: Desertqueen, cool---	45	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	0.92	Too sandy	0.12
		Too sandy	0.12		
Jumborox-----	25	Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00
Rock outcrop-----	15	Not rated		Not rated	
4620: Stranger-----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Water erosion	1.00	Water erosion	1.00
		Too sandy	0.50	Too sandy	0.50
Rock outcrop-----	35	Not rated		Not rated	
Grubstake, moist----	20	Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00
		Too sandy	0.88	Too sandy	0.88
4625: Grinder-----	50	Not limited		Not limited	
Grinder, cool-----	20	Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50
		Slope	0.02		
Pinkcan, cool-----	15	Somewhat limited		Somewhat limited	
		Large stones content	0.76	Large stones content	0.76

# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails	Value	Mountain bike and off-road vehicle trails	Value
		Rating class and limiting features		Rating class and limiting features	
4630:					
Thunderclap-----	50	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Smithcanyon-----	30	Very limited Large stones content Too sandy	1.00 0.88	Very limited Large stones content Too sandy	1.00 0.88
4804:					
Rock outcrop-----	45	Not rated		Not rated	
Ironped-----	25	Very limited Slope Too sandy	1.00 0.40	Very limited Slope Too sandy	1.00 0.40
Pinecity-----	20	Very limited Slope Large stones content Too sandy	1.00 1.00 0.92	Very limited Large stones content Slope Too sandy	1.00 0.99 0.92
4805:					
Rock outcrop-----	50	Not rated		Not rated	
Ironped, cool-----	30	Somewhat limited Too sandy	0.40	Somewhat limited Too sandy	0.40
4806:					
Rock outcrop-----	90	Not rated		Not rated	
4811:					
Rock outcrop-----	85	Not rated		Not rated	
Pioneertown-----	10	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
4825:					
Rock outcrop-----	30	Not rated		Not rated	
Grubstake-----	20	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
Cajon, rarely flooded-----	20	Very limited Too sandy	1.00	Very limited Too sandy	1.00
Stranger, warm-----	15	Very limited Too sandy	1.00	Very limited Too sandy	1.00
4830:					
Rock outcrop-----	80	Not rated		Not rated	
Pinecity, cool-----	10	Very limited Large stones content Too sandy	1.00 0.92	Very limited Large stones content Too sandy	1.00 0.92



# Soil Survey of Joshua Tree National Park, California

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4900:					
Rock outcrop-----	65	Not rated		Not rated	
Aguilareal-----	15	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Slope	1.00
		Too sandy	0.50	Too sandy	0.50
Lostpalms-----	15	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		content		content	
		Slope	1.00	Slope	1.00
		Too sandy	0.88	Too sandy	0.88

# Soil Survey of Joshua Tree National Park, California

Table 13.-Desert Tortoise Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The rating is based on the limitation with the highest value. Only five highest value limitations are listed. There may be more limitations. Fine-earth fractions and coarse fragments are reported on a weight basis. A brief rating criteria summary and abbreviations are listed at the end of this report)

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
1220:			
Jadestorm-----	60	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.80
		Fragments (>3") 10-25%	0.11
Blackeagle, cool-----	20	Poorly suited	
		Fragments (0.2-3") >75% in 0-30"	1.00
		Fragments (>3") 10-25%	0.20
		Depth to bedrock 10-20"	0.16
Rock outcrop-----	10	Not rated	
1225:			
Blackeagle-----	65	Suited	
		Depth to bedrock 10-20"	0.56
		Fragments (0.2-3") 50-75% in 0-30"	0.16
		Fragments (>3") 10-25%	0.06
Rock outcrop-----	15	Not rated	
1230:			
Jadestorm-----	45	Suited	
		Depth to bedrock 10-20"	0.84
		Fragments (0.2-3") 50-75% in 0-30"	0.80
		Fragments (>3") 10-25%	0.18
Jadestorm, cool-----	20	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.80
		Fragments (>3") 10-25%	0.06
Rock outcrop-----	15	Not rated	
1240:			
Meccapass-----	45	Suited	
		Fragments (0.2-3") 50-75% in 0-30"	0.92
Bulletproof-----	20	Suited	
		Depth to bedrock 10-20"	0.88
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Rock outcrop-----	10	Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
1241:			
Meccapass-----	45	Suited Fragments (0.2-3") 50-75% in 0-30"	0.92
Seanna-----	20	Suited Depth to bedrock 10-20"	0.80
Contactmine, dry-----	20	Suited Fragments (>3") 10-25%	0.10
1242:			
Meccapass-----	40	Suited Fragments (0.2-3") 50-75% in 0-30"	0.92
Jadestorm-----	25	Poorly suited Depth to bedrock 10-20" Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") 50-75% in 0-30" Fragments (>3") 10-25%	1.00 1.00 0.80 0.05
Rock outcrop-----	15	Not rated	
1250:			
Ironlung-----	50	Poorly suited Depth to bedrock 10-20" Cos, s, fs, vfs, or lcos in 0-30" Bulk density > 1.8g/cc 10-20" depth	1.00 1.00 1.00
Ironlung, cool-----	20	Poorly suited Depth to bedrock 10-20" Cos, s, fs, vfs, or lcos in 0-30"	1.00 1.00
Rock outcrop-----	15	Not rated	
1255:			
Goldenhills-----	40	Suited Cos1, ls, lfs, or lvfs in 0-30" Fragments (>3") 10-25%	0.50 0.02
Bulletproof-----	15	Suited Depth to bedrock 10-20" Cos1, ls, lfs, or lvfs in 0-30"	0.56 0.50
Fanhill-----	15	Suited Depth to bedrock 10-20" Fragments (>3") 10-25%	0.20 0.08
Whiterobe-----	15	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
1260:			
Whiterobe-----	45	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Bigbernie-----	20	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (>3") 10-25%	1.00 0.25
Whiterobe, cool-----	15	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
1410:			
Missionwell-----	50	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.97
Rock outcrop-----	20	Not rated	
Missionwell, high elevation-----	15	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.97
1415:			
Bolero-----	60	Not rated	
Rock outcrop-----	20	Not rated	
1504:			
Rizzo, rarely flooded, stony-----	50	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density > 1.8g/cc 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Flooding = rare	0.50
		Fragments (>3") 10-25%	0.14
Rizzo, occasionally flooded, stony	35	Poorly suited	
		Flooding >= occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density > 1.8g/cc 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Fragments (>3") 10-25%	0.13
1510:			
Carrizo, very gravelly sandy loam-	85	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.61
1511:			
Carrizo, channeled-----	75	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") >75% in 0-30"	1.00
		Flooding = rare	0.50
Carrizo, occasionally flooded-----	15	Poorly suited	
		Flooding >= occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") >75% in 0-30"	1.00
1512:			
Carrizo, extremely gravelly sandy loam-----	80	Suited	
		Fragments (0.2-3") 50-75% in 0-30"	0.61
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
		Fragments (>3") 10-25%	0.48
1513:			
Carrizo-----	60	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.61

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
1513: Carrizo, occasionally flooded, channeled-----	20	Poorly suited Flooding $\geq$ occasional Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") 50-75% in 0-30"	1.00 1.00 0.61
Rubylee-----	15	Suited Cosl, ls, lfs, or lvfs in 0-30"	0.50
1514: Carrizo, rarely flooded-----	40	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare Fragments (0.2-3") 50-75% in 0-30"	1.00 0.50 0.08
Pintobasin, fine sandy loam-----	30	Suited Cosl, ls, lfs, or lvfs in 0-30"	0.50
Rubylee-----	15	Suited Cosl, ls, lfs, or lvfs in 0-30"	0.50
1515: Pintobasin-----	80	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Carrizo, occasionally flooded-----	15	Poorly suited Flooding $\geq$ occasional Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") $>75\%$ in 0-30"	1.00 1.00 1.00
1516: Pintobasin, fine sandy loam-----	90	Suited Cosl, ls, lfs, or lvfs in 0-30"	0.50
1517: Pintobasin-----	65	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Dalelake-----	25	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
1520: Pintobasin, loamy sand-----	80	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare	1.00 0.50
1522: Pintobasin, rarely flooded-----	85	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare	1.00 0.50
1523: Pintobasin, rarely flooded-----	50	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare	1.00 0.50
Aquapeak-----	25	Suited Depth to pan 10-20"	0.89
Pintobasin, occasionally flooded--	20	Poorly suited Flooding $\geq$ occasional Cos, s, fs, vfs, or lcos in 0-30"	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
1524: Pintobasin, rarely flooded-----	90	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare	1.00 0.50
1525: Pintobasin, occasionally flooded--	45	Poorly suited Flooding >= occasional Cos, s, fs, vfs, or lcos in 0-30"	1.00 1.00
Pintobasin, rarely flooded-----	35	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare	1.00 0.50
1526: Pintobasin, rarely flooded-----	55	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare	1.00 0.50
Joetree-----	20	Suited Flooding = rare Cosl, ls, lfs, or lvfs in 0-30"	0.50 0.50
Patscamp-----	15	Suited Sicl, cl, or scl in 0-30"	0.50
1527: Pintobasin, moist-----	90	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
1530: Dalelake, fine sand-----	85	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
1531: Dalelake-----	60	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Pintobasin, rarely flooded-----	30	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare	1.00 0.50
1540: Carrizo, very rarely flooded-----	35	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") 50-75% in 0-30"	1.00 0.61
Carrizo, stable-----	25	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") 50-75% in 0-30"	1.00 0.61
Carrizo, occasionally flooded, rocky surface-----	20	Poorly suited Flooding >= occasional Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") 50-75% in 0-30"	1.00 1.00 0.08
Russiroks-----	20	Poorly suited Fragments (0.2-3") >75% in 0-30"	1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
1541:			
Carrizo, stable-----	50	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.61
Cambidic Haplodurids-----	40	Poorly suited	
		Fragments (0.2-3") >75% in 0-30"	1.00
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
		Depth to pan 10-20"	0.22
		Fragments (>3") 10-25%	0.01
1542:			
Carrizo, very rarely flooded-----	70	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.61
Carrizo, occasionally flooded-----	20	Poorly suited	
		Flooding >= occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") >75% in 0-30"	1.00
1550:			
Buzzardsprings, stable-----	35	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Coxpin-----	25	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
		Depth to pan 10-20"	0.14
Dalelake-----	20	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
1555:			
Goldrose-----	35	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Carsitas, very rarely flooded-----	30	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Chemwash, rarely flooded-----	25	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Flooding = rare	0.50
		Fragments (0.2-3") 50-75% in 0-30"	0.32
2003:			
Emptygun-----	100	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
2060:			
Joetree, very rarely flooded-----	35	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Dalelake-----	30	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Pintobasin, fine sandy loam-----	25	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50



# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
2065:			
Dalelake-----	30	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Aquapeak-----	25	Suited Depth to pan 10-20"	0.89
Coxpin-----	25	Suited Cosl, ls, lfs, or lvfs in 0-30" Depth to pan 10-20"	0.50 0.14
2067:			
Aquapeak, overblown-----	30	Suited Depth to pan 10-20"	0.56
Buzzardsprings-----	25	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Dalelake, thick sandy surface-----	20	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Buzzardsprings, steep-----	15	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
2068:			
Aquapeak-----	45	Suited Depth to pan 10-20"	0.89
Carpetflat, nongravelly surface---	35	Poorly suited Depth to pan 10-20" Cos, s, fs, vfs, or lcos in 0-30"	1.00 1.00
Pintobasin-----	15	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
2070:			
Missionsweet-----	60	Suited Fragments (0.2-3") 50-75% in 0-30" Fragments (>3") 10-25% Depth to pan 10-20"	0.92 0.11 0.11
Carpetflat-----	25	Suited Depth to pan 10-20"	0.56
2075:			
Oldale-----	50	Suited Fragments (0.2-3") 50-75% in 0-30" Cosl, ls, lfs, or lvfs in 0-30"	0.84 0.50
Missionsweet-----	30	Suited Fragments (0.2-3") 50-75% in 0-30" Fragments (>3") 10-25% Depth to pan 10-20"	0.92 0.11 0.11
2076:			
Oldale-----	40	Suited Fragments (0.2-3") 50-75% in 0-30" Cosl, ls, lfs, or lvfs in 0-30"	0.84 0.50
Carrizo-----	30	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") 50-75% in 0-30"	1.00 0.61

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
2077:			
Oldale-----	50	Suited Cosl, ls, lfs, or lvfs in 0-30"	0.50
Carrizo-----	25	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") 50-75% in 0-30"	1.00 0.61
Carrizo, very rarely flooded-----	15	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") 50-75% in 0-30"	1.00 0.61
2085:			
Rainbowsend-----	45	Poorly suited Fragments (>3") >25% Fragments (0.2-3") 50-75% in 0-30" Depth to pan 10-20"	1.00 0.54 0.05
Goldenbell-----	35	Suited Depth to pan 10-20"	0.82
2090:			
Deprave-----	35	Suited Cosl, ls, lfs, or lvfs in 0-30" Fragments (0.2-3") 50-75% in 0-30"	0.50 0.46
Rockhound-----	25	Poorly suited Fragments (0.2-3") >75% in 0-30" Sicl, cl, or scl in 0-30"	1.00 0.50
Rizzo-----	20	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Bulk density > 1.8g/cc 10-20" depth Fragments (0.2-3") 50-75% in 0-30" Fragments (>3") 10-25%	1.00 1.00 0.54 0.27
2091:			
Deprave-----	60	Suited Cosl, ls, lfs, or lvfs in 0-30" Fragments (0.2-3") 50-75% in 0-30"	0.50 0.46
Roostertail-----	15	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") 50-75% in 0-30"	1.00 0.20
2100:			
Perurose-----	50	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Coxpin-----	25	Suited Cosl, ls, lfs, or lvfs in 0-30" Depth to pan 10-20"	0.50 0.14
Pintobasin, gravelly surface-----	15	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.-Desert Tortoise Habitat-Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
2101:			
Perurose, rarely flooded-----	60	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Flooding = rare	0.50
Pintobasin, rarely flooded-----	35	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Flooding = rare	0.50
2110:			
Descent-----	80	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (>3") >25%	1.00
		Fragments (0.2-3") >75% in 0-30"	1.00
Descent, stable-----	15	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (>3") >25%	1.00
		Fragments (0.2-3") >75% in 0-30"	1.00
2111:			
Descent, warm-----	45	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (>3") >25%	1.00
		Fragments (0.2-3") >75% in 0-30"	1.00
Rubylee, very rarely flooded-----	40	Suited	
		Cosl, ls, lfs, or lvfs in 0-30"	0.50
2120:			
Rizzo, rarely flooded-----	35	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density > 1.8g/cc 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Flooding = rare	0.50
		Fragments (>3") 10-25%	0.14
Deprave-----	35	Suited	
		Cosl, ls, lfs, or lvfs in 0-30"	0.50
		Fragments (0.2-3") 50-75% in 0-30"	0.46
Rizzo, frequently flooded-----	20	Poorly suited	
		Flooding >= occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density > 1.8g/cc 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Fragments (>3") 10-25%	0.03
2121:			
Rizzo, rubbly-----	90	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density > 1.8g/cc 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Fragments (>3") 10-25%	0.24
2130:			
Goldenbell-----	55	Suited	
		Depth to pan 10-20"	0.82
Descent-----	40	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (>3") >25%	1.00
		Fragments (0.2-3") >75% in 0-30"	1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
2140: Rockhound, cobbly-----	85	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
2402: Rizzo-----	70	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Bulk density > 1.8g/cc 10-20" depth Fragments (0.2-3") 50-75% in 0-30" Fragments (>3") 10-25%	1.00 1.00 0.54 0.13
Rizzo, frequently flooded-----	20	Poorly suited Flooding >= occasional Cos, s, fs, vfs, or lcos in 0-30" Bulk density > 1.8g/cc 10-20" depth Fragments (0.2-3") 50-75% in 0-30" Fragments (>3") 10-25%	1.00 1.00 1.00 0.54 0.22
2403: Rizzo-----	80	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Bulk density > 1.8g/cc 10-20" depth Fragments (>3") 10-25%	1.00 1.00 0.15
Rizzo, occasionally flooded-----	15	Poorly suited Flooding >= occasional Cos, s, fs, vfs, or lcos in 0-30" Bulk density > 1.8g/cc 10-20" depth Fragments (0.2-3") 50-75% in 0-30" Fragments (>3") 10-25%	1.00 1.00 1.00 0.54 0.03
2404: Rizzo, occasionally flooded-----	60	Poorly suited Flooding >= occasional Cos, s, fs, vfs, or lcos in 0-30" Bulk density > 1.8g/cc 10-20" depth Fragments (0.2-3") 50-75% in 0-30" Fragments (>3") 10-25%	1.00 1.00 1.00 0.54 0.13
Rizzo, very rarely flooded-----	35	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Bulk density > 1.8g/cc 10-20" depth Fragments (0.2-3") 50-75% in 0-30" Fragments (>3") 10-25%	1.00 1.00 0.54 0.14
2405: Carrizo, rarely flooded-----	65	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare Fragments (0.2-3") 50-75% in 0-30"	1.00 0.50 0.08
Carrizo, occasionally flooded-----	25	Poorly suited Flooding >= occasional Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") >75% in 0-30"	1.00 1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
2406:			
Pintobasin, frequently flooded----	50	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Carrizo, occasionally flooded-----	40	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") $>75\%$ in 0-30"	1.00
2407:			
Pintobasin, rarely flooded-----	45	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Flooding = rare	0.50
Carrizo, occasionally flooded-----	30	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") $>75\%$ in 0-30"	1.00
Carrizo, frequently flooded-----	20	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") $>75\%$ in 0-30"	1.00
2408:			
Rizzo, frequently flooded-----	55	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density $> 1.8\text{g/cc}$ 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Fragments ( $>3"$ ) 10-25%	0.03
Rizzo, very rarely flooded-----	35	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density $> 1.8\text{g/cc}$ 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Fragments ( $>3"$ ) 10-25%	0.13
2409:			
Rizzo, frequently flooded-----	35	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density $> 1.8\text{g/cc}$ 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Fragments ( $>3"$ ) 10-25%	0.03
Chemwash, frequently flooded-----	30	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
Carsitas, occasionally flooded, braided-----	25	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
2420:			
Carsitas, frequently flooded-----	45	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Carsitas, occasionally flooded----	40	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Carsitas, rarely flooded-----	15	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Flooding = rare	0.50
2421:			
Carsitas, very rarely flooded-----	55	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Carsitas, rarely flooded-----	25	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Flooding = rare	0.50
2431:			
Chemwash, frequently flooded, braided-----	60	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
Chemwash, frequently flooded-----	25	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
2440:			
Rizzo-----	35	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density $> 1.8\text{g/cc}$ 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Fragments ( $>3$ ") 10-25%	0.03
Rizzo, occasionally flooded-----	30	Poorly suited	
		Flooding $\geq$ occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density $> 1.8\text{g/cc}$ 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Fragments ( $>3$ ") 10-25%	0.08
Rizzo, extremely stony-----	15	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density $> 1.8\text{g/cc}$ 10-20" depth	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.54
		Fragments ( $>3$ ") 10-25%	0.27
2715:			
Dalelake-----	35	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Sheephole-----	30	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Pintobasin-----	25	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.-Desert Tortoise Habitat-Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
2716:			
Dalelake, steep-----	75	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Dalelake-----	20	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
2717:			
Dalelake-----	40	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Rock outcrop-----	25	Not rated	
Buzzardsprings, fine sand-----	20	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
2718:			
Dalelake-----	55	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Sheephole, gravelly surface-----	45	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
2820:			
Rock outcrop-----	60	Not rated	
Impedimenta-----	25	Poorly suited Depth to bedrock 10-20" Cos, s, fs, vfs, or lcos in 0-30"	1.00 1.00
2825:			
Rock outcrop-----	35	Not rated	
Supplymine-----	25	Poorly suited Fragments (>3") >25%	1.00
Bolero, dry-----	15	Poorly suited Fragments (0.2-3") > 75% in 0-30" Fragments (>3") 10-25% Cosl, ls, lfs, or lvfs in 0-30" Depth to bedrock 10-20"	1.00 0.92 0.50 0.04
Ironage-----	15	Poorly suited Fragments (0.2-3") > 75% in 0-30" Fragments (>3") 10-25%	1.00 0.72
2830:			
Rock outcrop-----	80	Not rated	
Blackeagle, cool-----	10	Poorly suited Fragments (>3") > 25% Depth to bedrock 10-20" Fragments (0.2-3") 50-75% in 0-30"	1.00 0.36 0.12
2835:			
Rock outcrop-----	40	Not rated	
Blackeagle-----	40	Suited Depth to bedrock 10-20" Fragments (>3") 10-25%	0.24 0.03



# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
2840:			
Rock outcrop-----	65	Not rated	
Jadestorm-----	30	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.80
		Fragments (>3") 10-25%	0.06
3110:			
Coppermine, cool-----	40	Suited	
		Depth to bedrock 10-20"	0.92
		Fragments (0.2-3") 50-75% in 0-30"	0.03
Stranger-----	30	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
3120:			
Aguilareal-----	40	Suited	
		Fragments (>3") 10-25%	0.25
		Depth to bedrock 10-20"	0.08
Blackeagle-----	20	Suited	
		Depth to bedrock 10-20"	0.24
		Fragments (>3") 10-25%	0.03
Rock outcrop-----	15	Not rated	
3213:			
Dalvord-----	35	Poorly suited	
		Fragments (0.2-3") >75% in 0-30"	1.00
		Depth to bedrock 10-20"	0.56
Aguilareal-----	30	Suited	
		Fragments (>3") 10-25%	0.15
		Depth to bedrock 10-20"	0.08
Rock outcrop-----	25	Not rated	
3242:			
Langwell-----	50	Poorly suited	
		Depth to bedrock 10-20"	1.00
Rock outcrop-----	25	Not rated	
Helendale, cool-----	20	Well suited	
3285:			
Pinecity-----	30	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Contactmine-----	20	Suited	
		Fragments (>3") 10-25%	0.02
Desertqueen-----	20	Suited	
		Depth to bedrock 10-20"	0.92
Rock outcrop-----	15	Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
3286: Pinecity, gravelly loamy sand-----	85	Poorly suited Depth to bedrock 10-20" Cosl, ls, lfs, or lvfs in 0-30"	1.00 0.50
3291: Smithcanyon-----	40	Poorly suited Depth to bedrock 10-20" Cosl, ls, lfs, or lvfs in 0-30"	1.00 0.50
Stubbespring-----	25	Poorly suited Bulk density > 1.8g/cc 10-20" depth Depth to bedrock 10-20"	1.00 0.72
Rock outcrop-----	20	Not rated	
3292: Smithcanyon-----	35	Poorly suited Depth to bedrock 10-20" Cosl, ls, lfs, or lvfs in 0-30" Fragments (>3") 10-25%	1.00 0.50 0.10
Pinecity-----	25	Poorly suited Depth to bedrock 10-20" Cosl, ls, lfs, or lvfs in 0-30"	1.00 0.50
Rock outcrop-----	25	Not rated	
3293: Smithcanyon-----	50	Poorly suited Depth to bedrock 10-20" Cosl, ls, lfs, or lvfs in 0-30"	1.00 0.50
Pinecity-----	25	Poorly suited Depth to bedrock 10-20" Cosl, ls, lfs, or lvfs in 0-30"	1.00 0.50
3294: Smithcanyon, dry-----	80	Poorly suited Depth to bedrock 10-20" Cosl, ls, lfs, or lvfs in 0-30"	1.00 0.50
3295: Desertqueen, dry-----	40	Suited Depth to bedrock 10-20"	0.92
Hexie-----	20	Well suited	
Rock outcrop-----	20	Not rated	
3296: Desertqueen-----	45	Suited Fragments (>3") 10-25% Depth to bedrock 10-20"	0.90 0.64
Pinecity-----	35	Poorly suited Depth to bedrock 10-20" Cos, s, fs, vfs, or lcos in 0-30"	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
3297:			
Desertqueen, warm-----	40	Poorly suited Depth to bedrock 10-20"	1.00
Contactmine, dry-----	20	Suited Sic1, cl, or scl in 0-30"	0.50
Seanna, dry-----	20	Suited Depth to bedrock 10-20"	0.48
3325:			
Ironped, warm-----	30	Poorly suited Depth to bedrock 10-20" Cos, s, fs, vfs, or lcos in 0-30" Fragments (>3") 10-25%	1.00 1.00 0.01
Rock outcrop-----	20	Not rated	
Hexie-----	15	Well suited	
Ironped-----	15	Poorly suited Depth to bedrock 10-20" Cos, s, fs, vfs, or lcos in 0-30" Fragments (>3") 10-25%	1.00 1.00 0.01
3335:			
Xeric Torriorthents-----	40	Suited Cos1, ls, lfs, or lvfs in 0-30" Fragments (0.2-3") 50-75% in 0-30"	0.50 0.16
Rock outcrop-----	25	Not rated	
Xeric Torriorthents, warm-----	25	Suited Cos1, ls, lfs, or lvfs in 0-30" Fragments (0.2-3") 50-75% in 0-30"	0.50 0.16
3336:			
Xeric Torriorthents-----	45	Suited Cos1, ls, lfs, or lvfs in 0-30" Fragments (0.2-3") 50-75% in 0-30"	0.50 0.16
Bigbernie-----	25	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (>3") 10-25%	1.00 0.25
3340:			
Seanna-----	35	Suited Depth to bedrock 10-20" Fragments (0.2-3") 50-75% in 0-30"	0.32 0.03
Grubstake, moist-----	20	Suited Depth to bedrock 10-20"	0.20
Pinecity-----	15	Poorly suited Depth to bedrock 10-20" Cos1, ls, lfs, or lvfs in 0-30"	1.00 0.50

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
3345:			
Bigcanyon-----	55	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Bulk density > 1.8g/cc 10-20" depth	1.00
Bigcanyon, cool-----	20	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
3440:			
Pacific Mesa, steep-----	65	Poorly suited	
		Fragments (>3") >25%	1.00
		Depth to bedrock 10-20"	0.40
		Fragments (0.2-3") 50-75% in 0-30"	0.08
Pacific Mesa-----	30	Poorly suited	
		Fragments (>3") >25%	1.00
		Depth to bedrock 10-20"	0.32
		Fragments (0.2-3") 50-75% in 0-30"	0.08
3509:			
Cajon, very rarely flooded-----	60	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Friedliver-----	20	Suited	
		Fragments (0.2-3") 50-75% in 0-30"	0.01
3525:			
Cajon-----	70	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Friedliver-----	15	Suited	
		Flooding = rare	0.50
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
3526:			
Cajon-----	40	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Flooding = rare	0.50
Hypoint-----	35	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Arizo, occasionally flooded-----	15	Poorly suited	
		Flooding >= occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.74
		Fragments (>3") 10-25%	0.19
3611:			
Burntshack, sand surface-----	50	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Burntshack-----	35	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
3612:			
Burntshack-----	75	Well suited	
Burntshack, occasionally flooded--	20	Poorly suited	
		Flooding >= occasional	1.00

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
3676: Morongo, loamy sand, very rarely flooded-----	80	Suited Cosl, ls, lfs, or lvfs in 0-30"	0.50
3677: Morongo-----	80	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
3679: Morongo, cool-----	55	Poorly suited Bulk density > 1.8g/cc 10-20" depth Cosl, ls, lfs, or lvfs in 0-30"	1.00 0.50
Jumborox-----	20	Suited Cosl, ls, lfs, or lvfs in 0-30"	0.50
3680: Morongo-----	85	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
3681: Morongo, very rarely flooded-----	45	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Jumborox, dry-----	35	Suited Cosl, ls, lfs, or lvfs in 0-30"	0.50
3682: Morongo, cool-----	50	Poorly suited Bulk density > 1.8g/cc 10-20" depth Cosl, ls, lfs, or lvfs in 0-30"	1.00 0.50
Jumborox-----	15	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Urban land-----	15	Not rated	
3683: Morongo-----	55	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
Bluecut, very rarely flooded-----	30	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
3684: Morongo, warm-----	85	Poorly suited Cos, s, fs, vfs, or lcos in 0-30"	1.00
3685: Morongo, cool-----	65	Poorly suited Bulk density > 1.8g/cc 10-20" depth Cosl, ls, lfs, or lvfs in 0-30"	1.00 0.50
Desertqueen, undulating-----	15	Suited Depth to bedrock 10-20"	0.76
3690: Nasagold-----	85	Well suited	

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
3695: Gocougs-----	80	Well suited	
4031: Crosgrain-----	50	Suited	
		Depth to pan 10-20"	0.67
		Fragments (0.2-3") 50-75% in 0-30"	0.46
Crackerjack-----	30	Suited	
		Depth to pan 10-20"	0.67
Pinkcan, dry-----	15	Well suited	
4041: Silvermine-----	40	Poorly suited	
		Depth to pan 10-20"	1.00
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Helendale-----	30	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Burntshack, very rarely flooded---	20	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
4064: Gravesumit-----	55	Well suited	
Helendale, sandy surface-----	35	Well suited	
4071: Helendale-----	65	Well suited	
Desertqueen, very rarely flooded--	15	Suited	
		Depth to bedrock 10-20"	0.56
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
4091: Littlefargo-----	85	Well suited	
4245: Bluecut-----	40	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
		Sic1, cl, or scl in 0-30"	0.50
Morongo, very rarely flooded-----	25	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Yander, very rarely flooded-----	15	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
4260: Minhoyt-----	45	Poorly suited	
		Depth to pan 10-20"	1.00
		Bulk density > 1.8g/cc 10-20" depth	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Corbilt, rarely flooded-----	40	Suited	
		Flooding = rare	0.50
4265: Werewolf, warm-----	80	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
4270: Yuccabutte-----	95	Poorly suited Fragments (0.2-3") >75% in 0-30" Fragments (>3") >25% Sicl, cl, or scl in 0-30"	 1.00 1.00 0.50
4271: Yuccabutte, warm-----	60	Suited Sicl, cl, or scl in 0-30" Fragments (0.2-3") 50-75% in 0-30"	 0.50 0.12
Arizo, rarely flooded-----	30	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Flooding = rare	 1.00 0.50
4275: Pinkcan-----	35	Well suited	
Werewolf-----	25	Well suited	
Gocougs, warm-----	15	Suited Sicl, cl, or scl in 0-30"	 0.50
4280: Mekkadale-----	55	Suited Depth to pan 10-20"	 0.02
Edalph, warm-----	25	Suited Cosl, ls, lfs, or lvfs in 0-30"	 0.50
4285: Typic Argidurids-----	35	Suited Sicl, cl, or scl in 0-30" Fragments (0.2-3") 50-75% in 0-30"	 0.50 0.39
Coppermine-----	30	Suited Depth to bedrock 10-20" Fragments (0.2-3") 50-75% in 0-30"	 0.92 0.03
Minhoys, warm-----	25	Poorly suited Depth to pan 10-20"	 1.00
4403: Arizo, rarely flooded, channeled--	50	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") >75% in 0-30" Fragments (>3") 10-25% Flooding = rare	 1.00 1.00 0.88 0.50
Arizo, rarely flooded-----	25	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") >75% in 0-30" Fragments (>3") 10-25% Flooding = rare	 1.00 1.00 0.88 0.50
Arizo-----	20	Poorly suited Cos, s, fs, vfs, or lcos in 0-30" Fragments (0.2-3") >75% in 0-30" Fragments (>3") 10-25%	 1.00 1.00 0.96



# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
4440:			
Dragonwash, occasionally flooded---	55	Poorly suited	
		Flooding >= occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.01
Dragonwash, frequently flooded----	35	Poorly suited	
		Flooding >= occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Fragments (0.2-3") 50-75% in 0-30"	0.16
4450:			
Morongo, occasionally flooded-----	75	Poorly suited	
		Flooding >= occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Morongo, frequently flooded-----	15	Poorly suited	
		Flooding >= occasional	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
4605:			
Pinecity, moist-----	80	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
4606:			
Pinecity-----	60	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Rock outcrop-----	25	Not rated	
4607:			
Pinecity-----	85	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
4608:			
Pinecity-----	60	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Rock outcrop-----	30	Not rated	
4610:			
Desertqueen-----	35	Suited	
		Depth to bedrock 10-20"	0.56
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Jumborox, warm-----	25	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Rock outcrop-----	20	Not rated	
4615:			
Desertqueen, cool-----	45	Suited	
		Depth to bedrock 10-20"	0.68
Jumborox-----	25	Suited	
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Rock outcrop-----	15	Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
4620:			
Stranger-----	40	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Rock outcrop-----	35	Not rated	
Grubstake, moist-----	20	Suited	
		Depth to bedrock 10-20"	0.52
4625:			
Grinder-----	50	Poorly suited	
		Depth to bedrock 10-20"	1.00
Grinder, cool-----	20	Poorly suited	
		Depth to bedrock 10-20"	1.00
Pinkcan, cool-----	15	Well suited	
4630:			
Thunderclap-----	50	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
Smithcanyon-----	30	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Depth to bedrock 10-20"	0.64
4804:			
Rock outcrop-----	45	Not rated	
Ironped-----	25	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
Pinecity-----	20	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
4805:			
Rock outcrop-----	50	Not rated	
Ironped, cool-----	30	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos1, ls, lfs, or lvfs in 0-30"	0.50
4806:			
Rock outcrop-----	90	Not rated	
4811:			
Rock outcrop-----	85	Not rated	
Pioneertown-----	10	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
4825:			
Rock outcrop-----	30	Not rated	
Grubstake-----	20	Suited	
		Depth to bedrock 10-20"	0.52

# Soil Survey of Joshua Tree National Park, California

Table 13.—Desert Tortoise Habitat—Continued

Map symbol and soil name	Pct. of map unit	Desert tortoise habitat	
		Rating class and limiting features	Value
4825:			
Cajon, rarely flooded-----	20	Poorly suited	
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
		Flooding = rare	0.50
Stranger, warm-----	15	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cos, s, fs, vfs, or lcos in 0-30"	1.00
4830:			
Rock outcrop-----	80	Not rated	
Pinecity, cool-----	10	Poorly suited	
		Depth to bedrock 10-20"	1.00
		Cosl, ls, lfs, or lvfs in 0-30"	0.50
4900:			
Rock outcrop-----	65	Not rated	
Aguilareal-----	15	Suited	
		Fragments (>3") 10-25%	0.19
		Depth to bedrock 10-20"	0.08
Lostpalms-----	15	Poorly suited	
		Depth to bedrock 10-20"	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.-Dwellings and Small Commercial Buildings

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1220: Jadestorm-----	60	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.50	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00
Blackeagle, cool----	20	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1225: Blackeagle-----	65	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1230: Jadestorm-----	45	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.50	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00
Jadestorm, cool----	20	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.50	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1240: Meccapass-----	45	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.04	Very limited Slope	1.00
Bulletproof-----	20	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Rock outcrop-----	10	Not rated		Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1241:							
Meccapass-----	45	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.74	Very limited Slope	1.00
Seanna-----	20	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Contactmine, dry----	20	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.86	Very limited Slope	1.00
1242:							
Meccapass-----	40	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.74	Very limited Slope	1.00
Jadestorm-----	25	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 0.50	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00	Very limited Slope Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1250:							
Ironlung-----	50	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Ironlung, cool-----	20	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1255:							
Goldenhills-----	40	Very limited Slope	1.00	Very limited Slope Depth to hard bedrock	1.00 0.68	Very limited Slope	1.00
Bulletproof-----	15	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Fanhill-----	15	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1255: Whiterobe-----	15	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.82	Very limited Slope	1.00
1260: Whiterobe-----	45	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.88	Very limited Slope	1.00
Bigbernie-----	20	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.92	Very limited Slope	1.00
Whiterobe, cool----	15	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.88	Very limited Slope	1.00
1410: Missionwell-----	50	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Missionwell, high elevation-----	15	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
1415: Bolero-----	60	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
1504: Rizzo, rarely flooded, stony-----	50	Very limited Flooding Slope	1.00 0.04	Very limited Flooding Slope	1.00 0.04	Very limited Flooding Slope	1.00 1.00
Rizzo, occasionally flooded, stony-----	35	Very limited Flooding Slope	1.00 0.63	Very limited Flooding Slope	1.00 0.63	Very limited Flooding Slope	1.00 1.00
1510: Carrizo, very gravelly sandy loam	85	Not limited		Not limited		Not limited	

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1511:							
Carrizo, channeled--	75	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Carrizo, occasionally flooded-----	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
1512:							
Carrizo, extremely gravelly sandy loam	80	Not limited		Not limited		Not limited	
1513:							
Carrizo-----	60	Not limited		Not limited		Not limited	
Carrizo, occasionally flooded, channeled-	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Rubylee-----	15	Not limited		Not limited		Not limited	
1514:							
Carrizo, rarely flooded-----	40	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Pintobasin, fine sandy loam-----	30	Not limited		Not limited		Not limited	
Rubylee-----	15	Not limited		Not limited		Not limited	
1515:							
Pintobasin-----	80	Not limited		Not limited		Somewhat limited Slope	0.12
Carrizo, occasionally flooded-----	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
1516:							
Pintobasin, fine sandy loam-----	90	Not limited		Not limited		Not limited	
1517:							
Pintobasin-----	65	Not limited		Not limited		Not limited	
Dalelake-----	25	Not limited		Not limited		Not limited	
1520:							
Pintobasin, loamy sand-----	80	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
1522:							
Pintobasin, rarely flooded-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00



# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1523:							
Pintobasin, rarely flooded-----	50	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Aquapeak-----	25	Not limited		Very limited Depth to thin cemented pan	1.00	Somewhat limited Depth to thin cemented pan	1.00
Pintobasin, occasionally flooded-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
1524:							
Pintobasin, rarely flooded-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
1525:							
Pintobasin, occasionally flooded-----	45	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Pintobasin, rarely flooded-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
1526:							
Pintobasin, rarely flooded-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Joetree-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Patscamp-----	15	Not limited		Not limited		Not limited	
1527:							
Pintobasin, moist---	90	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
1530:							
Dalelake, fine sand-	85	Not limited		Not limited		Not limited	
1531:							
Dalelake-----	60	Not limited		Not limited		Not limited	
Pintobasin, rarely flooded-----	30	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
1540:							
Carrizo, very rarely flooded----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Carrizo, stable-----	25	Not limited		Not limited		Somewhat limited Slope	0.12

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1540: Carrizo, occasionally flooded, rocky surface-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Russiroks-----	20	Not limited		Not limited		Not limited	
1541: Carrizo, stable-----	50	Not limited		Not limited		Very limited Slope	1.00
Cambidic Haplodurids	40	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
1542: Carrizo, very rarely flooded-----	70	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.88
Carrizo, occasionally flooded-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.88
1550: Buzzardsprings, stable-----	35	Not limited		Not limited		Not limited	
Coxpin-----	25	Not limited		Very limited Depth to thin cemented pan	1.00	Somewhat limited Depth to thin cemented pan	1.00
Dalelake-----	20	Not limited		Not limited		Somewhat limited Slope	0.12
1555: Goldrose-----	35	Not limited		Not limited		Somewhat limited Slope	0.12
Carsitas, very rarely flooded-----	30	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.88
Chemwash, rarely flooded-----	25	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 1.00
2003: Emptygun-----	100	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2060:							
Joetree, very rarely flooded-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Dalelake-----	30	Not limited		Not limited		Not limited	
Pintobasin, fine sandy loam-----	25	Not limited		Not limited		Not limited	
2065:							
Dalelake-----	30	Not limited		Not limited		Not limited	
Aquapeak-----	25	Not limited		Very limited Depth to thin cemented pan	1.00	Somewhat limited Depth to thin cemented pan Slope	1.00 0.50
Coxpin-----	25	Not limited		Very limited Depth to thin cemented pan	1.00	Somewhat limited Depth to thin cemented pan	1.00
2067:							
Aquapeak, overblown-	30	Not limited		Very limited Depth to thin cemented pan	1.00	Somewhat limited Depth to thin cemented pan	1.00
Buzzardsprings-----	25	Not limited		Not limited		Not limited	
Dalelake, thick sandy surface-----	20	Not limited		Not limited		Very limited Slope	1.00
Buzzardsprings, steep-----	15	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
2068:							
Aquapeak-----	45	Not limited		Very limited Depth to thin cemented pan	1.00	Somewhat limited Depth to thin cemented pan	1.00
Carpetflat, nongravelly surface	35	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00
Pintobasin-----	15	Not limited		Not limited		Not limited	
2070:							
Missionsweet-----	60	Very limited Depth to thick cemented pan Slope	1.00 0.84	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope	1.00 1.00 0.84	Very limited Slope Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2070: Carpetflat-----	25	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00
2075: Oldale-----	50	Not limited		Not limited		Not limited	
Missionsweet-----	30	Very limited Depth to thick cemented pan Slope	1.00 0.84	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope	1.00 1.00 0.84	Very limited Slope Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00 1.00
2076: Oldale-----	40	Not limited		Not limited		Not limited	
Carrizo-----	30	Not limited		Not limited		Not limited	
2077: Oldale-----	50	Not limited		Not limited		Not limited	
Carrizo-----	25	Not limited		Not limited		Not limited	
Carrizo, very rarely flooded-----	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2085: Rainbowsend-----	45	Very limited Depth to thick cemented pan Slope Large stones	1.00 1.00 0.04	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope Large stones	1.00 1.00 1.00 0.04	Very limited Slope Depth to thick cemented pan Depth to thin cemented pan Large stones	1.00 1.00 1.00 0.04
Goldenbell-----	35	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00
2090: Deprave-----	35	Not limited		Very limited Depth to thick cemented pan	1.00	Not limited	
Rockhound-----	25	Not limited		Not limited		Not limited	
Rizzo-----	20	Not limited		Not limited		Not limited	
2091: Deprave-----	60	Somewhat limited Depth to thick cemented pan	0.92	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 0.92	Somewhat limited Depth to thick cemented pan	0.92

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2091: Roostertail-----	15	Not limited		Somewhat limited Depth to thick cemented pan	0.05	Not limited	
2100: Perurose-----	50	Not limited		Somewhat limited Depth to thin cemented pan	0.46	Not limited	
Coxpin-----	25	Not limited		Very limited Depth to thin cemented pan	1.00	Somewhat limited Depth to thin cemented pan	1.00
Pintobasin, gravelly surface---	15	Not limited		Not limited		Somewhat limited Slope	0.12
2101: Perurose, rarely flooded-----	60	Very limited Flooding	1.00	Very limited Flooding Depth to thin cemented pan	1.00 0.65	Very limited Flooding	1.00
Pintobasin, rarely flooded-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2110: Descent-----	80	Very limited Slope Large stones	1.00 0.05	Very limited Slope Large stones	1.00 0.05	Very limited Slope Large stones	1.00 0.05
Descent, stable-----	15	Somewhat limited Large stones	0.04	Somewhat limited Large stones	0.04	Somewhat limited Large stones	0.04
2111: Descent, warm-----	45	Very limited Slope Large stones	1.00 0.05	Very limited Slope Large stones	1.00 0.05	Very limited Slope Large stones	1.00 0.05
Rubylee, very rarely flooded-----	40	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
2120: Rizzo, rarely flooded-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.12
Deprave-----	35	Somewhat limited Depth to thick cemented pan	0.23	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 0.23	Somewhat limited Depth to thick cemented pan	0.23
Rizzo, frequently flooded-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2121: Rizzo, rubbly-----	90	Not limited		Not limited		Very limited Slope	1.00
2130: Goldenbell-----	55	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00
Descent-----	40	Somewhat limited Slope Large stones	0.63 0.03	Somewhat limited Slope Large stones	0.63 0.03	Very limited Slope Large stones	1.00 0.03
2140: Rockhound, cobbly---	85	Not limited		Not limited		Very limited Slope	1.00
2402: Rizzo-----	70	Not limited		Not limited		Somewhat limited Slope	0.12
Rizzo, frequently flooded-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2403: Rizzo-----	80	Not limited		Not limited		Somewhat limited Slope	0.12
Rizzo, occasionally flooded-----	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2404: Rizzo, occasionally flooded-----	60	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Rizzo, very rarely flooded-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2405: Carrizo, rarely flooded-----	65	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Carrizo, occasionally flooded-----	25	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2406: Pintobasin, frequently flooded-	50	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Carrizo, occasionally flooded-----	40	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2407:							
Pintobasin, rarely flooded-----	45	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Carrizo, occasionally flooded-----	30	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Carrizo, frequently flooded-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2408:							
Rizzo, frequently flooded-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Rizzo, very rarely flooded-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2409:							
Rizzo, frequently flooded-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Chemwash, frequently flooded-	30	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Carsitas, occasionally flooded, braided---	25	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2420:							
Carsitas, frequently flooded-	45	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Carsitas, occasionally flooded-----	40	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Carsitas, rarely flooded-----	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2421:							
Carsitas, very rarely flooded----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.12
Carsitas, rarely flooded-----	25	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.50



# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2431: Chemwash, frequently flooded, braided----	60	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.12
Chemwash, frequently flooded----	25	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.50
2440: Rizzo-----	35	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Rizzo, occasionally flooded-----	30	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Slope Flooding	1.00 1.00
Rizzo, extremely stony-----	15	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
2715: Dalelake-----	35	Not limited		Not limited		Somewhat limited Slope	0.50
Sheephole-----	30	Not limited		Not limited		Not limited	
Pintobasin-----	25	Not limited		Not limited		Not limited	
2716: Dalelake, steep-----	75	Not limited		Not limited		Very limited Slope	1.00
Dalelake-----	20	Not limited		Not limited		Somewhat limited Slope	0.50
2717: Dalelake-----	40	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Not limited		Not limited		Not limited	
2718: Dalelake-----	55	Not limited		Not limited		Not limited	
Sheephole, gravelly surface-----	45	Not limited		Not limited		Not limited	
2820: Rock outcrop-----	60	Not rated		Not rated		Not rated	
Impedimenta-----	25	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2825:							
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Supplymine-----	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.20	Depth to hard bedrock	1.00	Depth to hard bedrock	0.20
		Large stones	0.06	Large stones	0.06	Large stones	0.06
Bolero, dry-----	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Ironage-----	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.92	Depth to hard bedrock	1.00	Depth to hard bedrock	0.92
2830:							
Rock outcrop-----	80	Not rated		Not rated		Not rated	
Blackeagle, cool----	10	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.50	Large stones	0.50	Large stones	0.50
2835:							
Rock outcrop-----	40	Not rated		Not rated		Not rated	
Blackeagle-----	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
2840:							
Rock outcrop-----	65	Not rated		Not rated		Not rated	
Jadestorm-----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
3110:							
Coppermine, cool----	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Stranger-----	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.96	Slope	0.96	Depth to hard bedrock	1.00
3120:							
Aguilareal-----	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3120:							
Blackeagle-----	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
3213:							
Dalvord-----	35	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Aguilareal-----	30	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
3242:							
Langwell-----	50	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Helendale, cool-----	20	Not limited		Not limited		Somewhat limited Slope	0.12
3285:							
Pinecity-----	30	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
Contactmine-----	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
				Depth to soft bedrock	0.77		
Desertqueen-----	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
3286:							
Pinecity, gravelly loamy sand-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
3291:							
Smithcanyon-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3291: Stubbespring-----	25	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3292: Smithcanyon-----	35	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Pinecity-----	25	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
3293: Smithcanyon-----	50	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Pinecity-----	25	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
3294: Smithcanyon, dry----	80	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
3295: Desertqueen, dry----	40	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Hexie-----	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3296: Desertqueen-----	45	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Pinecity-----	35	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3297:							
Desertqueen, warm---	40	Very limited Slope	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Slope	1.00
Contactmine, dry----	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Seanna, dry-----	20	Very limited Slope	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Slope	1.00
3325:							
Ironped, warm-----	30	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Hexie-----	15	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
				Depth to soft bedrock	0.08		
Ironped-----	15	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
3335:							
Xeric Torriorthents-	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Xeric Torriorthents, warm	25	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
3336:							
Xeric Torriorthents-	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Bigbernie-----	25	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
				Depth to soft bedrock	0.92		
3340:							
Seanna-----	35	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
Grubstake, moist----	20	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to hard bedrock	0.50	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to hard bedrock	0.50

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3340: Pinecity-----	15	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
3345: Bigcanyon-----	55	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope	1.00
Bigcanyon, cool-----	20	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.93	Very limited Slope	1.00
3440: Pacific Mesa, steep-	65	Very limited Slope Depth to hard bedrock Large stones	1.00 1.00 0.17	Very limited Slope Depth to hard bedrock Large stones	1.00 1.00 0.17	Very limited Slope Depth to hard bedrock Large stones	1.00 1.00 0.17
Pacific Mesa-----	30	Very limited Depth to hard bedrock Large stones	1.00 0.18	Very limited Depth to hard bedrock Large stones	1.00 0.18	Very limited Slope Depth to hard bedrock Large stones	1.00 1.00 0.18
3509: Cajon, very rarely flooded-----	60	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.12
Friedliver-----	20	Not limited		Not limited		Not limited	
3525: Cajon-----	70	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Friedliver-----	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
3526: Cajon-----	40	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Hypoint-----	35	Not limited		Not limited		Not limited	
Arizo, occasionally flooded-----	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
3611: Burntshack, sand surface-----	50	Not limited		Not limited		Not limited	
Burntshack-----	35	Not limited		Not limited		Very limited Slope	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3612: Burntshack-----	75	Not limited		Not limited		Not limited	
Burntshack, occasionally flooded-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
3676: Morongo, loamy sand, very rarely flooded-----	80	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
3677: Morongo-----	80	Not limited		Not limited		Not limited	
3679: Morongo, cool-----	55	Not limited		Not limited		Not limited	
Jumborox-----	20	Not limited		Not limited		Not limited	
3680: Morongo-----	85	Not limited		Not limited		Not limited	
3681: Morongo, very rarely flooded-----	45	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Jumborox, dry-----	35	Not limited		Not limited		Somewhat limited Slope	0.12
3682: Morongo, cool-----	50	Not limited		Not limited		Not limited	
Jumborox-----	15	Not limited		Not limited		Somewhat limited Slope	0.88
Urban land-----	15	Not rated		Not rated		Not rated	
3683: Morongo-----	55	Not limited		Not limited		Somewhat limited Slope	0.12
Bluecut, very rarely flooded-----	30	Not limited		Not limited		Not limited	
3684: Morongo, warm-----	85	Not limited		Not limited		Somewhat limited Slope	0.50
3685: Morongo, cool-----	65	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Desertqueen, undulating-----	15	Very limited Slope	1.00	Very limited Depth to soft bedrock	1.00	Very limited Slope	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Depth to soft bedrock	1.00



# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3690: Nasagold-----	85	Not limited		Not limited		Not limited	
3695: Gocougs-----	80	Not limited		Somewhat limited Depth to thin cemented pan	0.20	Not limited	
4031: Crosgrain-----	50	Very limited Depth to thick cemented pan Slope	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope	1.00 1.00 1.00	Very limited Slope Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00 1.00
Crackerjack-----	30	Very limited Depth to thick cemented pan Slope	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope	1.00 1.00 1.00	Very limited Slope Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00 1.00
Pinkcan, dry-----	15	Not limited		Somewhat limited Depth to thick cemented pan	0.68	Somewhat limited Slope	0.50
4041: Silvermine-----	40	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Slope Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00 1.00
Helendale-----	30	Not limited		Not limited		Not limited	
Burntshack, very rarely flooded----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
4064: Gravesumit-----	55	Not limited		Not limited		Not limited	
Helendale, sandy surface-----	35	Not limited		Not limited		Not limited	
4071: Helendale-----	65	Not limited		Not limited		Somewhat limited Slope	0.88
Desertqueen, very rarely flooded----	15	Somewhat limited Slope Depth to soft bedrock	0.63 0.50	Very limited Depth to soft bedrock Slope	1.00 0.63	Very limited Depth to soft bedrock Slope	1.00 1.00
4091: Littlefargo-----	85	Somewhat limited Slope	0.16	Somewhat limited Slope Depth to soft bedrock	0.16 0.15	Very limited Slope	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4245:							
Bluecut-----	40	Not limited		Not limited		Very limited Slope	1.00
Morongo, very rarely flooded----	25	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Yander, very rarely flooded-----	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
4260:							
Minhyot-----	45	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00
Corbilt, rarely flooded-----	40	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
4265:							
Werewolf, warm-----	80	Not limited		Not limited		Somewhat limited Slope	0.50
4270:							
Yuccabutte, extremely cobbly sandy loam-----	95	Very limited Slope Large stones	1.00 0.43	Very limited Slope Large stones	1.00 0.43	Very limited Slope Large stones	1.00 0.43
4271:							
Yuccabutte, warm----	60	Not limited		Not limited		Somewhat limited Slope	0.50
Arizo, rarely flooded-----	30	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.12
4275:							
Pinkcan-----	35	Not limited		Somewhat limited Depth to thick cemented pan	0.68	Not limited	
Werewolf-----	25	Not limited		Not limited		Not limited	
Gocougs, warm-----	15	Not limited		Somewhat limited Depth to thin cemented pan	0.13	Not limited	
4280:							
Mekkadale-----	55	Very limited Slope	1.00	Very limited Depth to thin cemented pan Slope	1.00 1.00	Very limited Depth to thin cemented pan Slope	1.00 1.00
Edalph, warm-----	25	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4285:							
Typic Argidurids----	35	Very limited Slope	1.00	Very limited Depth to thick cemented pan	1.00	Very limited Slope	1.00
		Depth to thick cemented pan	0.94	Slope	1.00	Depth to thick cemented pan	0.94
				Depth to thin cemented pan	0.93		
Coppermine-----	30	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Minhoyt, warm-----	25	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan	1.00
		Slope	0.63	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
				Slope	0.63	Slope	1.00
4403:							
Arizo, rarely flooded, channeled-	50	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Arizo, rarely flooded-----	25	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Arizo-----	20	Not limited		Not limited		Somewhat limited Slope	0.12
4440:							
Dragonwash, occasionally flooded-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Dragonwash, frequently flooded-	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
4450:							
Morongo, occasionally flooded-----	75	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Morongo, frequently flooded-----	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
4605:							
Pinecity, moist-----	80	Somewhat limited Depth to soft bedrock	0.50	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
						Slope	0.12

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4606:							
Pinecity-----	60	Very limited Slope	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Slope	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
4607:							
Pinecity-----	85	Somewhat limited Depth to soft bedrock	0.50	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
						Slope	0.88
4608:							
Pinecity-----	60	Somewhat limited Depth to soft bedrock	0.50	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00
						Slope	1.00
Rock outcrop-----	30	Not rated		Not rated		Not rated	
4610:							
Desertqueen-----	35	Somewhat limited Depth to soft bedrock	0.50	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
						Slope	0.12
Jumborox, warm-----	25	Not limited		Not limited		Somewhat limited Slope	0.50
Rock outcrop-----	20	Not rated		Not rated		Not rated	
4615:							
Desertqueen, cool---	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
Jumborox-----	25	Not limited		Not limited		Not limited	
Rock outcrop-----	15	Not rated		Not rated		Not rated	
4620:							
Stranger-----	40	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Grubstake, moist----	20	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Slope	1.00
		Slope	1.00	Depth to soft bedrock	1.00	Depth to hard bedrock	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Depth to soft bedrock	1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4625: Grinder-----	50	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock Slope	1.00 0.12
Grinder, cool-----	20	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
Pinkcan, cool-----	15	Not limited		Somewhat limited Depth to thick cemented pan	0.68	Somewhat limited Slope	0.88
4630: Thunderclap-----	50	Not limited		Not limited		Somewhat limited Slope	0.50
Smithcanyon-----	30	Somewhat limited Depth to soft bedrock Slope	0.50 0.16	Very limited Depth to soft bedrock Slope	1.00 0.16	Very limited Slope Depth to soft bedrock	1.00 1.00
4804: Rock outcrop-----	45	Not rated		Not rated		Not rated	
Ironped-----	25	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Pinecity-----	20	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
4805: Rock outcrop-----	50	Not rated		Not rated		Not rated	
Ironped, cool-----	30	Very limited Slope Depth to soft bedrock	1.00 0.50	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
4806: Rock outcrop-----	90	Not rated		Not rated		Not rated	
4811: Rock outcrop-----	85	Not rated		Not rated		Not rated	
Pioneertown-----	10	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 14.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4825:							
Rock outcrop-----	30	Not rated		Not rated		Not rated	
Grubstake-----	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
Cajon, rarely flooded-----	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Stranger, warm-----	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
4830:							
Rock outcrop-----	80	Not rated		Not rated		Not rated	
Pinecity, cool-----	10	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Depth to soft bedrock	1.00
4900:							
Rock outcrop-----	65	Not rated		Not rated		Not rated	
Aguilareal-----	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Lostpalms-----	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
		Large stones	0.02	Large stones	0.02	Large stones	0.02

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1220: Jadestorm-----	60	Very limited Depth to hard bedrock Slope Depth to soft bedrock	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Droughty Gravel Large stones	1.00 1.00 1.00 1.00
Blackeagle, cool----	20	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Gravel Droughty Large stones	1.00 1.00 1.00 1.00 0.79
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1225: Blackeagle-----	65	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Droughty Large stones Gravel	1.00 1.00 1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1230: Jadestorm-----	45	Very limited Depth to hard bedrock Slope Depth to soft bedrock	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Droughty Gravel Large stones	1.00 1.00 1.00 1.00 1.00
Jadestorm, cool----	20	Very limited Depth to hard bedrock Slope Depth to soft bedrock	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Droughty Gravel Large stones	1.00 1.00 1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1240: Meccapass-----	45	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 1.00 0.04	Very limited Slope Droughty Gravel Large stones Depth to bedrock	1.00 1.00 1.00 0.05 0.04



# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1240:							
Bulletproof-----	20	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Droughty Large stones Gravel	1.00 1.00 1.00 1.00 0.99
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1241:							
Meccapass-----	45	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 1.00 0.74	Very limited Slope Droughty Gravel Depth to bedrock Large stones	1.00 1.00 1.00 1.00 0.74 0.68
Seanna-----	20	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Gravel	1.00 1.00 1.00 0.16
Contactmine, dry----	20	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock Unstable excavation walls	1.00 0.86 0.10	Very limited Slope Depth to bedrock Droughty Gravel	1.00 0.86 0.49 0.01
1242:							
Meccapass-----	40	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 1.00 0.74	Very limited Slope Droughty Gravel Depth to bedrock Large stones	1.00 1.00 1.00 1.00 0.74 0.68
Jadestorm-----	25	Very limited Depth to hard bedrock Slope Depth to soft bedrock	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Droughty Gravel Large stones	1.00 1.00 1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1250:							
Ironlung-----	50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Too sandy Gravel	1.00 1.00 1.00 0.50 0.21

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1250:							
Ironlung, cool-----	20	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Too sandy Gravel	1.00 1.00 1.00 0.50 0.21
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1255:							
Goldenhills-----	40	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to hard bedrock	1.00 1.00 0.68	Very limited Slope Droughty Large stones Gravel	1.00 1.00 1.00 0.99
Bulletproof-----	15	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Large stones Gravel	1.00 1.00 1.00 1.00 0.99
Fanhill-----	15	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Gravel Droughty Large stones	1.00 1.00 1.00 1.00 1.00
Whiterobe-----	15	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 1.00 0.82	Very limited Slope Gravel Droughty Large stones Depth to bedrock	1.00 1.00 1.00 0.84 0.82
1260:							
Whiterobe-----	45	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 1.00 0.88	Very limited Slope Droughty Gravel Depth to bedrock	1.00 1.00 1.00 0.88
Bigbernie-----	20	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 1.00 0.92	Very limited Slope Droughty Depth to bedrock Gravel	1.00 1.00 0.92 0.30
Whiterobe, cool-----	15	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 1.00 0.88	Very limited Slope Droughty Gravel Depth to bedrock	1.00 1.00 1.00 0.88

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1410:							
Missionwell-----	50	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Gravel Droughty Large stones	1.00 1.00 1.00 1.00 0.08
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Missionwell, high elevation-----	15	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Gravel Droughty Large stones	1.00 1.00 1.00 1.00 0.08
1415:							
Bolero-----	60	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Large stones Droughty Gravel	1.00 1.00 1.00 1.00 0.17
Rock outcrop-----	20	Not rated		Not rated		Not rated	
1504:							
Rizzo, rarely flooded, stony-----	50	Somewhat limited Flooding Slope	0.40 0.04	Very limited Unstable excavation walls Slope	1.00 1.00 0.04	Very limited Droughty Slope	1.00 0.04
Rizzo, occasionally flooded, stony-----	35	Very limited Flooding Slope	1.00 0.63	Very limited Unstable excavation walls Slope Flooding	1.00 1.00 0.63 0.60	Very limited Droughty Slope Flooding Too sandy	1.00 0.63 0.60 0.50
1510:							
Carrizo, very gravelly sandy loam	85	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Gravel	1.00 1.00
1511:							
Carrizo, channeled--	75	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
Carrizo, occasionally flooded-----	15	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Gravel Flooding	1.00 1.00 0.60

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1512: Carrizo, extremely gravelly sandy loam	80	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Large stones Gravel	1.00 1.00 0.98
1513: Carrizo-----	60	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
Carrizo, occasionally flooded, channeled-	20	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Gravel Droughty Large stones Flooding	1.00 1.00 0.61 0.60
Rubylee-----	15	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.70
1514: Carrizo, rarely flooded-----	40	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Very limited Droughty Gravel	1.00 0.36
Pintobasin, fine sandy loam-----	30	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.29
Rubylee-----	15	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.70
1515: Pintobasin-----	80	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.92
Carrizo, occasionally flooded-----	15	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Gravel Flooding	1.00 1.00 0.60
1516: Pintobasin, fine sandy loam-----	90	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.29
1517: Pintobasin-----	65	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.92

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1517: Dalelake-----	25	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
1520: Pintobasin, loamy sand-----	80	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.94
1522: Pintobasin, rarely flooded-----	85	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.92 0.50
1523: Pintobasin, rarely flooded-----	50	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.92 0.50
Aquapeak-----	25	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan Unstable excavation walls	1.00 1.00	Very limited Depth to cemented pan Droughty Gravel	1.00 1.00 1.00
Pintobasin, occasionally flooded-----	20	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Somewhat limited Droughty Flooding Too sandy	0.92 0.60 0.50
1524: Pintobasin, rarely flooded-----	90	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.92 0.50
1525: Pintobasin, occasionally flooded-----	45	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Somewhat limited Droughty Flooding Too sandy	0.92 0.60 0.50
Pintobasin, rarely flooded-----	35	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.94
1526: Pintobasin, rarely flooded-----	55	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.89

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1526: Joetree-----	20	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
Patscamp-----	15	Not limited		Very limited Unstable excavation walls	1.00	Not limited	
1527: Pintobasin, moist---	90	Somewhat limited Slope	0.37	Very limited Unstable excavation walls Slope	1.00 0.37	Somewhat limited Droughty Slope	0.94 0.37
1530: Dalelake, fine sand-	85	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
1531: Dalelake-----	60	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
Pintobasin, rarely flooded-----	30	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.92 0.50
1540: Carrizo, very rarely flooded-----	35	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Very limited Droughty Gravel	1.00 1.00
Carrizo, stable-----	25	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
Carrizo, occasionally flooded, rocky surface-----	20	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Flooding Gravel	1.00 0.60 0.36
Russiroks-----	20	Not limited		Very limited Unstable excavation walls	1.00	Very limited Gravel Droughty	1.00 1.00
1541: Carrizo, stable-----	50	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1541: Cambidic Haplodurids	40	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00 1.00	Very limited Depth to cemented pan Gravel Droughty Large stones	1.00 1.00 1.00 0.95
1542: Carrizo, very rarely flooded-----	70	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
Carrizo, occasionally flooded-----	20	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Gravel Flooding	1.00 1.00 0.60
1550: Buzzardsprings, stable-----	35	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.91
Coxpin-----	25	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan Unstable excavation walls	1.00 1.00	Very limited Depth to cemented pan Droughty	1.00 1.00
Dalelake-----	20	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
1555: Goldrose-----	35	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
Carsitas, very rarely flooded-----	30	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Very limited Droughty Too sandy	1.00 0.50
Chemwash, rarely flooded-----	25	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Very limited Droughty Too sandy Gravel	1.00 0.50 0.05
2003: Emptygun-----	100	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Gravel Droughty	1.00 1.00 1.00



# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2060: Joetree, very rarely flooded-----	35	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.65
Dalelake-----	30	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
Pintobasin, fine sandy loam-----	25	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.29
2065: Dalelake-----	30	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
Aquapeak-----	25	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00	Very limited Depth to cemented pan Gravel Droughty Large stones	1.00 1.00 1.00 0.16
Coxpin-----	25	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00	Very limited Depth to cemented pan Droughty	1.00 1.00
2067: Aquapeak, overblown-	30	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00	Very limited Depth to cemented pan Gravel Droughty	1.00 1.00 1.00
Buzzardsprings-----	25	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.91
Dalelake, thick sandy surface-----	20	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
Buzzardsprings, steep-----	15	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty Gravel	1.00 0.90 0.38
2068: Aquapeak-----	45	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00	Very limited Depth to cemented pan Droughty Gravel	1.00 1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2068: Carpetflat, nongravelly surface	35	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00	Very limited Depth to cemented pan Droughty Gravel	1.00 1.00 0.74
Pintobasin-----	15	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.92
2070: Missionsweet-----	60	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope	1.00 1.00 0.84	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope Unstable excavation walls	1.00 1.00 0.84 0.50	Very limited Depth to cemented pan Gravel Droughty Slope Large stones	1.00 1.00 1.00 0.84 0.38
Carpetflat-----	25	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to cemented pan Gravel Droughty Large stones	1.00 1.00 1.00 0.84
2075: Olddale-----	50	Not limited		Very limited Unstable excavation walls	1.00	Very limited Gravel Droughty Large stones	1.00 0.93 0.38
Missionsweet-----	30	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope	1.00 1.00 0.84	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope Unstable excavation walls	1.00 1.00 0.84 0.50	Very limited Depth to cemented pan Gravel Droughty Slope Large stones	1.00 1.00 1.00 0.84 0.38
2076: Olddale-----	40	Not limited		Very limited Unstable excavation walls	1.00	Very limited Gravel Large stones Droughty	1.00 1.00 0.95
Carrizo-----	30	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Gravel	1.00 1.00
2077: Olddale-----	50	Not limited		Very limited Unstable excavation walls	1.00	Very limited Gravel Droughty Large stones	1.00 1.00 0.32

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2077:							
Carrizo-----	25	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
Carrizo, very rarely flooded-----	15	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Very limited Droughty Gravel	1.00 1.00
2085:							
Rainbowsend-----	45	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope Large stones	1.00 1.00 1.00 0.04	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope Unstable excavation walls Large stones	1.00 1.00 1.00 1.00 0.50 0.04	Very limited Depth to cemented pan Droughty Large stones Slope	1.00 1.00 1.00 1.00
Goldenbell-----	35	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00 1.00	Very limited Depth to cemented pan Gravel Droughty Large stones	1.00 1.00 1.00 0.08
2090:							
Deprave-----	35	Not limited		Very limited Depth to thick cemented pan Unstable excavation walls Dense layer	1.00 1.00 0.50	Very limited Gravel Droughty Large stones	1.00 1.00 0.08
Rockhound-----	25	Not limited		Very limited Unstable excavation walls	1.00	Very limited Gravel Droughty Large stones	1.00 0.39 0.32
Rizzo-----	20	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Large stones Gravel	1.00 1.00 0.92
2091:							
Deprave-----	60	Somewhat limited Depth to thick cemented pan	0.92	Very limited Depth to thick cemented pan Unstable excavation walls Depth to thin cemented pan Dense layer	1.00 1.00 0.92 0.50	Very limited Gravel Droughty Depth to cemented pan Large stones	1.00 1.00 0.92 0.08
Roostertail-----	15	Not limited		Very limited Unstable excavation walls Depth to thick cemented pan	1.00 0.05	Very limited Gravel Droughty	1.00 0.88

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2100:							
Perurose-----	50	Not limited		Very limited		Very limited	
				Unstable	1.00	Gravel	1.00
				excavation walls		Droughty	1.00
				Depth to thin	0.46	Depth to cemented	0.46
				cemented pan		pan	
						Large stones	0.38
Coxpin-----	25	Somewhat limited		Very limited		Very limited	
		Depth to thin	1.00	Depth to thin	1.00	Depth to	1.00
		cemented pan		cemented pan		cemented pan	
				Unstable	1.00	Droughty	1.00
				excavation walls			
Pintobasin, gravelly surface---	15	Not limited		Very limited		Somewhat limited	
				Unstable	1.00	Droughty	0.94
				excavation walls			
2101:							
Perurose, rarely flooded-----	60	Somewhat limited		Very limited		Very limited	
		Flooding	0.40	Unstable	1.00	Droughty	1.00
				excavation walls		Depth to cemented	0.64
				Depth to thin	0.65	pan	
				cemented pan		Too sandy	0.50
Pintobasin, rarely flooded-----	35	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.40	Unstable	1.00	Droughty	0.92
				excavation walls		Too sandy	0.50
2110:							
Descent-----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Unstable	1.00	Droughty	1.00
		Large stones	0.05	excavation walls		Large stones	1.00
				Slope	1.00	Gravel	1.00
				Large stones	0.05	Slope	1.00
Descent, stable----	15	Somewhat limited		Very limited		Very limited	
		Large stones	0.04	Unstable	1.00	Droughty	1.00
				excavation walls		Large stones	1.00
				Large stones	0.04	Gravel	1.00
2111:							
Descent, warm-----	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.05	Unstable	1.00	Droughty	1.00
				excavation walls		Large stones	1.00
				Large stones	0.05	Gravel	1.00
Rubylee, very rarely flooded-----	40	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Unstable	1.00	Droughty	0.70
				excavation walls		Slope	0.63
				Slope	0.63		
2120:							
Rizzo, rarely flooded-----	35	Somewhat limited		Very limited		Very limited	
		Flooding	0.40	Unstable	1.00	Droughty	1.00
				excavation walls			

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2120: Deprave-----	35	Somewhat limited Depth to thick cemented pan	0.23	Very limited Depth to thick cemented pan Unstable excavation walls Dense layer Depth to thin cemented pan	1.00 1.00 0.50 0.23	Very limited Gravel Droughty Depth to cemented pan Large stones	1.00 1.00 0.23 0.08
Rizzo, frequently flooded-----	20	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Too sandy Droughty Gravel	1.00 1.00 1.00 0.26
2121: Rizzo, rubbly-----	90	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Large stones Gravel	1.00 1.00 0.11
2130: Goldenbell-----	55	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00 1.00	Very limited Depth to cemented pan Gravel Droughty Large stones	1.00 1.00 1.00 0.08
Descent-----	40	Somewhat limited Slope Large stones	0.63 0.03	Very limited Unstable excavation walls Slope Large stones	1.00 0.63 0.03	Very limited Droughty Slope	1.00 0.63
2140: Rockhound, cobbly---	85	Not limited		Very limited Unstable excavation walls	1.00	Very limited Gravel Droughty Large stones	1.00 0.73 0.32
2402: Rizzo-----	70	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Too sandy	1.00 0.50
Rizzo, frequently flooded-----	20	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Too sandy Droughty Gravel Large stones	1.00 1.00 1.00 1.00 0.95
2403: Rizzo-----	80	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Gravel Large stones	1.00 0.73 0.20

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2403: Rizzo, occasionally flooded-----	15	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Too sandy Droughty Flooding Gravel	1.00 1.00 0.60 0.26
2404: Rizzo, occasionally flooded-----	60	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Flooding Too sandy	1.00 0.60 0.50
Rizzo, very rarely flooded-----	35	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
2405: Carrizo, rarely flooded-----	65	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Very limited Droughty Gravel	1.00 0.36
Carrizo, occasionally flooded-----	25	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Gravel Flooding	1.00 1.00 0.60
2406: Pintobasin, frequently flooded-	50	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Droughty Too sandy Gravel	1.00 0.97 0.50 0.05
Carrizo, occasionally flooded-----	40	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Gravel Flooding	1.00 1.00 0.60
2407: Pintobasin, rarely flooded-----	45	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.92 0.50
Carrizo, occasionally flooded-----	30	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Gravel Flooding	1.00 1.00 0.60

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2407: Carrizo, frequently flooded-----	20	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Droughty Too sandy	1.00 1.00 0.50
2408: Rizzo, frequently flooded-----	55	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Too sandy Droughty Gravel	1.00 1.00 1.00 0.26
Rizzo, very rarely flooded-----	35	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Very limited Droughty Too sandy	1.00 0.50
2409: Rizzo, frequently flooded-----	35	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Droughty Gravel	1.00 1.00 0.38
Chemwash, frequently flooded-	30	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Too sandy Droughty Gravel	1.00 1.00 1.00 1.00
Carsitas, occasionally flooded, braided---	25	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Flooding Too sandy	1.00 0.60 0.50
2420: Carsitas, frequently flooded-	45	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Droughty Too sandy	1.00 1.00 0.50
Carsitas, occasionally flooded-----	40	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Flooding Too sandy	1.00 0.60 0.50
Carsitas, rarely flooded-----	15	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00



# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2421: Carsitas, very rarely flooded-----	55	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
Carsitas, rarely flooded-----	25	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
2431: Chemwash, frequently flooded, braided---	60	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Too sandy Droughty Gravel	1.00 1.00 1.00 1.00
Chemwash, frequently flooded-	25	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Too sandy Droughty Gravel	1.00 1.00 1.00 1.00
2440: Rizzo-----	35	Somewhat limited Slope	0.16	Very limited Unstable excavation walls Slope	1.00 0.16	Very limited Droughty Gravel Slope	1.00 0.38 0.16
Rizzo, occasionally flooded-----	30	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Too sandy Droughty Gravel Large stones Flooding	1.00 1.00 1.00 0.95 0.60
Rizzo, extremely stony-----	15	Somewhat limited Slope	0.63	Very limited Unstable excavation walls Slope	1.00 0.63	Very limited Droughty Large stones Gravel Slope	1.00 1.00 0.92 0.63
2715: Dalelake-----	35	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
Sheephole-----	30	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.96
Pintobasin-----	25	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.92

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2716:							
Dalelake, steep-----	75	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
Dalelake-----	20	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
2717:							
Dalelake-----	40	Somewhat limited Slope	0.16	Very limited Unstable excavation walls Slope	1.00 0.16	Somewhat limited Droughty Slope	0.69 0.16
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.82
2718:							
Dalelake-----	55	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.69
Sheephole, gravelly surface-----	45	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.96
2820:							
Rock outcrop-----	60	Not rated		Not rated		Not rated	
Impedimenta-----	25	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 0.50	Very limited Depth to bedrock Droughty Slope Gravel	1.00 1.00 1.00 0.38
2825:							
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Supplymine-----	25	Very limited Slope Depth to hard bedrock Large stones	1.00 0.20 0.06	Very limited Depth to hard bedrock Slope Unstable excavation walls Large stones	1.00 1.00 1.00 0.10 0.06	Very limited Slope Large stones Droughty Gravel Depth to bedrock	1.00 1.00 0.99 0.82 0.20
Bolero, dry-----	15	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Large stones Droughty Gravel	1.00 1.00 1.00 1.00 0.86

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2825:							
Ironage-----	15	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard	1.00	Slope	1.00
		Depth to hard	0.92	bedrock		Large stones	1.00
		bedrock		Slope	1.00	Droughty	1.00
				Unstable	1.00	Depth to bedrock	0.92
				excavation walls		Gravel	0.81
2830:							
Rock outcrop-----	80	Not rated		Not rated		Not rated	
Blackeagle, cool----	10	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock		Slope	1.00
		Slope	1.00	Slope	1.00	Large stones	1.00
		Large stones	0.50	Large stones	0.50	Droughty	1.00
				Unstable	0.50		
				excavation walls			
2835:							
Rock outcrop-----	40	Not rated		Not rated		Not rated	
Blackeagle-----	40	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock		Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Unstable	0.50	Large stones	1.00
				excavation walls		Gravel	1.00
2840:							
Rock outcrop-----	65	Not rated		Not rated		Not rated	
Jadestorm-----	30	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock		Slope	1.00
		Slope	1.00	Depth to soft	1.00	Droughty	1.00
		Depth to soft	1.00	bedrock		Gravel	1.00
		bedrock		Slope	1.00	Large stones	1.00
				Unstable	0.50		1.00
				excavation walls			
3110:							
Coppermine, cool----	40	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock		Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Unstable	0.10		
				excavation walls			
Stranger-----	30	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock		Droughty	1.00
		Slope	0.96	Slope	0.96	Slope	0.96
				Unstable	0.50	Gravel	0.05
				excavation walls			
3120:							
Aguilareal-----	40	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock		Slope	1.00
		Slope	1.00	Slope	1.00	Large stones	1.00
				Unstable	0.50	Droughty	1.00
				excavation walls		Gravel	0.92

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3120: Blackeagle-----	20	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Droughty Large stones Gravel	1.00 1.00 1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
3213: Dalvord-----	35	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Droughty Gravel Large stones	1.00 1.00 1.00 1.00 0.32
Aguilareal-----	30	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope Large stones Droughty Gravel	1.00 1.00 1.00 1.00 0.92
Rock outcrop-----	25	Not rated		Not rated		Not rated	
3242: Langwell-----	50	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Droughty Slope Gravel	1.00 1.00 1.00 0.84
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Helendale, cool----	20	Not limited		Somewhat limited Unstable excavation walls	0.10	Not limited	
3285: Pinecity-----	30	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Gravel	1.00 1.00 1.00 0.38
Contactmine-----	20	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 1.00 0.77	Very limited Slope Depth to bedrock Droughty	1.00 0.77 0.29
Desertqueen-----	20	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3285: Rock outcrop-----	15	Not rated		Not rated		Not rated	
3286: Pinecity, gravelly loamy sand-----	85	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Gravel	1.00 1.00 1.00 0.38
3291: Smithcanyon-----	40	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 1.00
Stubbespring-----	25	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Too sandy Droughty Too dense	1.00 1.00 1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3292: Smithcanyon-----	35	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Large stones	1.00 1.00 1.00 0.26
Pinecity-----	25	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Gravel	1.00 1.00 1.00 0.05
Rock outcrop-----	25	Not rated		Not rated		Not rated	
3293: Smithcanyon-----	50	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Too sandy Large stones	1.00 1.00 1.00 0.50 0.01
Pinecity-----	25	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Gravel	1.00 1.00 1.00 0.05

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3294: Smithcanyon, dry----	80	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Too sandy Gravel	1.00 1.00 1.00 0.50 0.05
3295: Desertqueen, dry----	40	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 1.00
Hexie-----	20	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.10	Very limited Slope Gravel Droughty	1.00 1.00 0.45
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3296: Desertqueen-----	45	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Large stones Too sandy	1.00 1.00 1.00 0.74 0.50
Pinecity-----	35	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Too sandy	1.00 1.00 1.00 0.50
3297: Desertqueen, warm---	40	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Droughty Slope	1.00 1.00 1.00
Contactmine, dry----	20	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 0.10	Very limited Slope Gravel	1.00 0.01
Seanna, dry-----	20	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Droughty Slope Gravel	1.00 1.00 1.00 0.16

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3325:							
Ironped, warm-----	30	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Too sandy Large stones	1.00 1.00 1.00 0.50 0.01
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Hexie-----	15	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 0.08	Very limited Slope Droughty Large stones Depth to bedrock	1.00 0.68 0.11 0.08
Ironped-----	15	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Too sandy Large stones	1.00 1.00 1.00 0.50 0.01
3335:							
Xeric Torriorthents-	40	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Xeric Torriorthents, warm	25	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 1.00
3336:							
Xeric Torriorthents-	45	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 1.00
Bigbernie-----	25	Very limited Slope	1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	1.00 1.00 0.92	Very limited Slope Droughty Depth to bedrock Gravel	1.00 1.00 0.92 0.30
3340:							
Seanna-----	35	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 1.00



# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3340: Grubstake, moist----	20	Very limited Slope Depth to soft bedrock Depth to hard bedrock	 1.00 1.00  0.50	Very limited Depth to hard bedrock Depth to soft bedrock Slope Unstable excavation walls	 1.00  1.00  1.00 0.50	Very limited Depth to bedrock Slope Gravel Droughty Large stones Droughty	 1.00 1.00 1.00 1.00 0.08 1.00
Pinecity-----	15	Very limited Slope Depth to soft bedrock	 1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	 1.00  1.00 0.10	Very limited Depth to bedrock Slope Droughty	 1.00 1.00 1.00
3345: Bigcanyon-----	55	Very limited Slope	 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls Dense layer	 1.00  1.00 1.00 0.50	Very limited Slope Droughty Depth to bedrock Too sandy	 1.00 1.00 1.00 0.50
Bigcanyon, cool-----	20	Very limited Slope	 1.00	Very limited Slope Unstable excavation walls Depth to soft bedrock	 1.00 1.00  0.93	Very limited Slope Droughty Depth to bedrock Too sandy	 1.00 1.00 0.94 0.50
3440: Pacific Mesa, steep-	65	Very limited Depth to hard bedrock Slope Large stones	 1.00 1.00 0.17	Very limited Depth to hard bedrock Slope Large stones Unstable excavation walls	 1.00 1.00 1.00 0.17 0.10	Very limited Depth to bedrock Slope Droughty Gravel Large stones	 1.00 1.00 1.00 0.28 0.16
Pacific Mesa-----	30	Very limited Depth to hard bedrock Large stones	 1.00 0.18	Very limited Depth to hard bedrock Large stones Unstable excavation walls	 1.00 0.18 0.10	Very limited Depth to bedrock Droughty	 1.00 1.00
3509: Cajon, very rarely flooded-----	60	Somewhat limited Flooding	 0.20	Very limited Unstable excavaton walls	 1.00	Somewhat limited Droughty Too sandy	 0.84 0.50
Friedliver-----	20	Not limited		Very limited Unstable excavation walls	 1.00	Very limited Gravel	 1.00

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3525: Cajon-----	70	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Gravel Too sandy	0.93 0.74 0.50
Friedliver-----	15	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Too sandy Droughty Gravel	0.50 0.49 0.32
3526: Cajon-----	40	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Gravel	0.70 0.32
Hypoint-----	35	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
Arizo, occasionally flooded-----	15	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Too sandy Droughty Flooding Gravel	1.00 1.00 0.60 0.26
3611: Burntshack, sand surface-----	50	Not limited		Very limited Unstable excavation walls	1.00	Very limited Too sandy Droughty	1.00 0.80
Burntshack-----	35	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.79 0.50
3612: Burntshack-----	75	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.59 0.50
Burntshack, occasionally flooded-----	20	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Somewhat limited Gravel Droughty Flooding Too sandy	0.74 0.61 0.60 0.50
3676: Morongo, loamy sand, very rarely flooded-----	80	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
3677: Morongo-----	80	Not limited		Very limited Unstable excavation walls	1.00	Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3679: Morongo, cool-----	55	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Too sandy	1.00 0.50
Jumborox-----	20	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Too sandy Droughty	0.50 0.09
3680: Morongo-----	85	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.93
3681: Morongo, very rarely flooded-----	45	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.96 0.50
Jumborox, dry-----	35	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Too sandy Droughty	0.50 0.09
3682: Morongo, cool-----	50	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Too sandy	1.00 0.50
Jumborox-----	15	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.35
Urban land-----	15	Not rated		Not rated		Not rated	
3683: Morongo-----	55	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
Bluecut, very rarely flooded-----	30	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.01
3684: Morongo, warm-----	85	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
3685: Morongo, cool-----	65	Somewhat limited Slope	0.63	Very limited Unstable excavation walls Slope	1.00 0.63	Very limited Droughty Slope Too sandy	1.00 0.63 0.50
Desertqueen, undulating-----	15	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Droughty Slope	1.00 1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3690: Nasagold-----	85	Not limited		Very limited Unstable excavation walls	1.00	Not limited	
3695: Gocougs-----	80	Not limited		Very limited Unstable excavation walls Depth to thin cemented pan	1.00 0.20	Somewhat limited Too sandy Depth to cemented pan	0.50 0.20
4031: Crosgrain-----	50	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope	1.00 1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope Unstable excavation walls	1.00 1.00 1.00 1.00 0.10	Very limited Depth to cemented pan Droughty Slope Gravel Large stones	1.00 1.00 1.00 1.00 0.40 0.01
Crackerjack-----	30	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope	1.00 1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope Unstable excavation walls	1.00 1.00 1.00 1.00 0.10	Very limited Depth to cemented pan Droughty Slope Gravel	1.00 1.00 1.00 0.08
Pinkcan, dry-----	15	Not limited		Very limited Unstable excavation walls Depth to thick cemented pan	1.00 0.68	Not limited	
4041: Silvermine-----	40	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00 1.00	Very limited Depth to cemented pan Droughty	1.00 1.00
Helendale-----	30	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.16
Burntshack, very rarely flooded-----	20	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.69 0.50
4064: Gravesumit-----	55	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.01

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4064: Helendale, sandy surface-----	35	Not limited		Somewhat limited Unstable excavation walls	0.10	Not limited	
4071: Helendale-----	65	Not limited		Somewhat limited Unstable excavation walls	0.10	Not limited	
Desertqueen, very rarely flooded-----	15	Somewhat limited Depth to soft bedrock Slope	1.00  0.63	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00  0.63 0.10	Very limited Depth to bedrock Droughty Slope	1.00 1.00 0.63
4091: Littlefargo-----	85	Somewhat limited Slope	0.16	Somewhat limited Slope Depth to soft bedrock Unstable excavation walls	0.16 0.15 0.10	Somewhat limited Slope Depth to bedrock Droughty	0.16 0.16 0.04
4245: Bluecut-----	40	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.14
Morongo, very rarely flooded-----	25	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.96 0.50
Yander, very rarely flooded-----	15	Somewhat limited Flooding	0.20	Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
4260: Minhoyt-----	45	Very limited Depth to thick cemented pan Depth to thin cemented pan	1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to cemented pan Droughty	1.00 1.00
Corbilt, rarely flooded-----	40	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Too sandy Droughty	0.50 0.03
4265: Werewolf, warm-----	80	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty Gravel	1.00 0.11

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4270: Yuccabutte, extremely cobbly sandy loam-----	95	Very limited Slope Large stones	1.00 0.43	Very limited Unstable excavation walls Slope Large stones	1.00 1.00 0.43	Very limited Slope Droughty Large stones Gravel	1.00 1.00 0.61 0.31
4271: Yuccabutte, warm----	60	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.85
Arizo, rarely flooded-----	30	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
4275: Pinkcan-----	35	Not limited		Very limited Unstable excavation walls Depth to thick cemented pan	1.00 0.68	Not limited	
Werewolf-----	25	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.39
Gocougs, warm-----	15	Not limited		Very limited Unstable excavation walls Depth to thin cemented pan	1.00 0.13	Somewhat limited Depth to cemented pan	0.13
4280: Mekkadale-----	55	Very limited Depth to thin cemented pan Slope	1.00 1.00	Very limited Depth to thin cemented pan Unstable excavation walls Slope	1.00 1.00 1.00	Very limited Depth to cemented pan Slope Droughty	1.00 1.00 0.80
Edalph, warm-----	25	Very limited Slope	1.00	Very limited Slope Unstable excavation walls	1.00 1.00	Very limited Slope Droughty	1.00 0.52
4285: Typic Argidurids----	35	Very limited Slope Depth to thick cemented pan	1.00 0.94	Very limited Depth to thick cemented pan Unstable excavation walls Slope Depth to thin cemented pan	1.00 1.00 1.00 0.93	Very limited Gravel Slope Depth to cemented pan Droughty	1.00 1.00 0.93 0.86

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4285: Coppermine-----	30	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 0.10	Very limited Depth to bedrock Droughty Slope	1.00 1.00 1.00
Minhoyt, warm-----	25	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope	1.00 1.00 0.63	Very limited Depth to thick cemented pan Depth to thin cemented pan Slope Unstable excavation walls	1.00 1.00 0.63 0.10	Very limited Depth to cemented pan Droughty Slope	1.00 1.00 0.63
4403: Arizo, rarely flooded, channeled-	50	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Very limited Droughty Too sandy Gravel	1.00 0.50 0.29
Arizo, rarely flooded-----	25	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Very limited Droughty Too sandy Gravel	1.00 0.50 0.29
Arizo-----	20	Not limited		Very limited Unstable excavation walls	1.00	Very limited Droughty	1.00
4440: Dragonwash, occasionally flooded-----	55	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Somewhat limited Droughty Flooding	0.69 0.60
Dragonwash, frequently flooded-	35	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Droughty Too sandy	1.00 0.69 0.50
4450: Morongo, occasionally flooded-----	75	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.60	Very limited Droughty Flooding Too sandy	1.00 0.60 0.50
Morongo, frequently flooded-----	15	Very limited Flooding	1.00	Very limited Unstable excavation walls Flooding	1.00 0.80	Very limited Flooding Droughty Too sandy	1.00 1.00 0.50



# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4605: Pinecity, moist-----	80	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Unstable excavation walls	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
4606: Pinecity-----	60	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 0.10	Very limited Depth to bedrock Droughty Slope Gravel Large stones	1.00 1.00 1.00 0.05 0.01
Rock outcrop-----	25	Not rated		Not rated		Not rated	
4607: Pinecity-----	85	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Unstable excavation walls	1.00 0.10	Very limited Depth to bedrock Droughty Too sandy	1.00 1.00 0.50
4608: Pinecity-----	60	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Unstable excavation walls	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Rock outcrop-----	30	Not rated		Not rated		Not rated	
4610: Desertqueen-----	35	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Unstable excavation walls	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Jumborox, warm-----	25	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty	0.33
Rock outcrop-----	20	Not rated		Not rated		Not rated	
4615: Desertqueen, cool---	45	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 1.00
Jumborox-----	25	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Too sandy Droughty	0.50 0.09
Rock outcrop-----	15	Not rated		Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4620: Stranger-----	40	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Droughty Slope	1.00 1.00 1.00
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Grubstake, moist----	20	Very limited Depth to hard bedrock Depth to soft bedrock Slope	1.00 1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 1.00 0.50	Very limited Depth to bedrock Droughty Slope	1.00 1.00 1.00
4625: Grinder-----	50	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 1.00 0.50	Very limited Depth to bedrock Droughty Gravel	1.00 1.00 0.11
Grinder, cool-----	20	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Droughty Slope Gravel	1.00 1.00 1.00 0.54
Pinkcan, cool-----	15	Not limited		Very limited Unstable excavation walls Depth to thick cemented pan	1.00 0.68	Not limited	
4630: Thunderclap-----	50	Not limited		Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.92 0.50
Smithcanyon-----	30	Somewhat limited Depth to soft bedrock Slope	1.00 0.16	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 0.16 0.10	Very limited Depth to bedrock Droughty Slope	1.00 1.00 0.16
4804: Rock outcrop-----	45	Not rated		Not rated		Not rated	
Ironped-----	25	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Gravel	1.00 1.00 1.00 0.05

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4804: Pinecity-----	20	Very limited Slope Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Gravel Large stones	1.00 1.00 1.00 0.05 0.01
4805: Rock outcrop-----	50	Not rated		Not rated		Not rated	
Ironped, cool-----	30	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Droughty Slope Gravel	1.00 1.00 1.00 0.05
4806: Rock outcrop-----	90	Not rated		Not rated		Not rated	
4811: Rock outcrop-----	85	Not rated		Not rated		Not rated	
Pioneertown-----	10	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Gravel Too sandy	1.00 1.00 1.00 0.84 0.50
4825: Rock outcrop-----	30	Not rated		Not rated		Not rated	
Grubstake-----	20	Very limited Depth to hard bedrock Depth to soft bedrock	1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Unstable excavation walls	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Droughty	1.00 1.00
Cajon, rarely flooded-----	20	Somewhat limited Flooding	0.40	Very limited Unstable excavation walls	1.00	Somewhat limited Droughty Too sandy	0.84 0.50
Stranger, warm-----	15	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock Unstable excavation walls	1.00 0.50	Very limited Depth to bedrock Droughty Too sandy	1.00 1.00 0.50
4830: Rock outcrop-----	80	Not rated		Not rated		Not rated	
Pinecity, cool-----	10	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Unstable excavation walls	1.00 1.00 1.00 0.10	Very limited Depth to bedrock Droughty Slope Gravel Large stones	1.00 1.00 1.00 0.05 0.01

# Soil Survey of Joshua Tree National Park, California

Table 15.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4900:							
Rock outcrop-----	65	Not rated		Not rated		Not rated	
Aguilareal-----	15	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock		Large stones	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Unstable	0.50	Slope	1.00
				excavation walls		Gravel	0.92
Lostpalms-----	15	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock		Droughty	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.02	Unstable	0.50	Large stones	0.01
				excavation walls			
				Large stones	0.02		

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1220:					
Jadestorm-----	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Depth to soft	1.00
				bedrock	
				Slope	1.00
				Seepage	0.02
Blackeagle, cool----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
Rock outcrop-----	10	Not rated		Not rated	
1225:					
Blackeagle-----	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
Rock outcrop-----	15	Not rated		Not rated	
1230:					
Jadestorm-----	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Depth to soft	1.00
				bedrock	
				Slope	1.00
				Seepage	0.02
Jadestorm, cool----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Depth to soft	1.00
				bedrock	
				Slope	1.00
				Seepage	0.02
Rock outcrop-----	15	Not rated		Not rated	
1240:					
Meccapass-----	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
		Filtering	1.00	Slope	1.00
		capacity		Seepage	1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1240: Bulletproof-----	20	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
Rock outcrop-----	10	Not rated		Not rated	
1241: Meccapass-----	45	Very limited Depth to bedrock Slope Filtering capacity	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
Seanna-----	20	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
Contactmine, dry----	20	Very limited Depth to bedrock Slope Slow water movement	1.00 1.00 0.98	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
1242: Meccapass-----	40	Very limited Depth to bedrock Slope Filtering capacity	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
Jadestorm-----	25	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 0.02
Rock outcrop-----	15	Not rated		Not rated	
1250: Ironlung-----	50	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
Ironlung, cool-----	20	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
Rock outcrop-----	15	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1255: Goldenhills-----	40	Very limited Filtering capacity Slope Depth to bedrock	1.00 1.00 1.00 0.88	Very limited Slope Seepage Depth to hard bedrock	1.00 1.00 0.68
Bulletproof-----	15	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 1.00
Fanhill-----	15	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 1.00
Whiterobe-----	15	Very limited Depth to bedrock Filtering capacity Slope	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 1.00
1260: Whiterobe-----	45	Very limited Depth to bedrock Filtering capacity Slope	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 1.00
Bigbernie-----	20	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 1.00
Whiterobe, cool-----	15	Very limited Depth to bedrock Filtering capacity Slope	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 1.00
1410: Missionwell-----	50	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
Rock outcrop-----	20	Not rated		Not rated	
Missionwell, high elevation-----	15	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00



# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1415: Bolero-----	60	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Seepage Large stones	1.00 1.00 1.00 0.11
Rock outcrop-----	20	Not rated		Not rated	
1504: Rizzo, rarely flooded, stony-----	50	Very limited Filtering capacity Flooding Slope	1.00 0.40 0.04	Very limited Seepage Slope Flooding	1.00 1.00 0.40
Rizzo, occasionally flooded, stony-----	35	Very limited Flooding Filtering capacity Slope	1.00 1.00 0.63	Very limited Flooding Seepage Slope	1.00 1.00 1.00
1510: Carrizo, very gravelly sandy loam	85	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
1511: Carrizo, channeled--	75	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
Carrizo, occasionally flooded-----	15	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
1512: Carrizo, extremely gravelly sandy loam	80	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
1513: Carrizo-----	60	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Carrizo, occasionally flooded, channeled-	20	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1513: Rubylee-----	15	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
1514: Carrizo, rarely flooded-----	40	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40
Pintobasin, fine sandy loam-----	30	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Rubylee-----	15	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
1515: Pintobasin-----	80	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
Carrizo, occasionally flooded-----	15	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
1516: Pintobasin, fine sandy loam-----	90	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
1517: Pintobasin-----	65	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
Dalelake-----	25	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
1520: Pintobasin, loamy sand-----	80	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
1522: Pintobasin, rarely flooded-----	85	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1523: Pintobasin, rarely flooded-----	50	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40
Aquapeak-----	25	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage	1.00 1.00
Pintobasin, occasionally flooded-----	20	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
1524: Pintobasin, rarely flooded-----	90	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40
1525: Pintobasin, occasionally flooded-----	45	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
Pintobasin, rarely flooded-----	35	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
1526: Pintobasin, rarely flooded-----	55	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
Joetree-----	20	Somewhat limited Slow water movement Flooding	0.68 0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
Patscamp-----	15	Somewhat limited Slow water movement	0.68	Very limited Seepage	1.00
1527: Pintobasin, moist---	90	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1530: Dalelake, fine sand-	85	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
1531: Dalelake-----	60	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Pintobasin, rarely flooded-----	30	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40
1540: Carrizo, very rarely flooded----	35	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 0.32 0.20
Carrizo, stable----	25	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
Carrizo, occasionally flooded, rocky surface-----	20	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.32
Russiroks-----	20	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
1541: Carrizo, stable----	50	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 1.00
Cambidic Haplodurids	40	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.32
1542: Carrizo, very rarely flooded----	70	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 1.00 0.20
Carrizo, occasionally flooded-----	20	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1550: Buzzardsprings, stable-----	35	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
Coxpin-----	25	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.08
Dalelake-----	20	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
1555: Goldrose-----	35	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
Carsitas, very rarely flooded-----	30	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 1.00 0.20
Chemwash, rarely flooded-----	25	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Slope Flooding	1.00 1.00 0.40
2003: Emptygun-----	100	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
2060: Joetree, very rarely flooded-----	35	Somewhat limited Slow water movement Flooding	0.68 0.20	Very limited Seepage Flooding	1.00 0.20
Dalelake-----	30	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Pintobasin, fine sandy loam-----	25	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
2065: Dalelake-----	30	Very limited Filtering capacity	1.00	Very limited Seepage	1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2065:					
Aquapeak-----	25	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.92
Coxpin-----	25	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage	1.00 1.00
2067:					
Aquapeak, overblown-	30	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.32
Buzzardsprings-----	25	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Dalelake, thick sandy surface-----	20	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 1.00
Buzzardsprings, steep-----	15	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
2068:					
Aquapeak-----	45	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage	1.00 1.00
Carpetflat, nongravelly surface	35	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.08
Pintobasin-----	15	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
2070:					
Missionsweet-----	60	Very limited Depth to cemented pan Slope	1.00 0.84	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
Carpetflat-----	25	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2075:					
Oldale-----	50	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Missionsweet-----	30	Very limited Depth to cemented pan Slope	1.00 0.84	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
2076:					
Oldale-----	40	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Carrizo-----	30	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
2077:					
Oldale-----	50	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Carrizo-----	25	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
Carrizo, very rarely flooded-----	15	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 0.32 0.20
2085:					
Rainbowsend-----	45	Very limited Depth to cemented pan Slope Large stones	1.00 1.00 0.04	Very limited Depth to cemented pan Slope Seepage Large stones	1.00 1.00 1.00 0.65
Goldenbell-----	35	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.32
2090:					
Deprave-----	35	Very limited Depth to cemented pan Filtering capacity	1.00 1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.08
Rockhound-----	25	Somewhat limited Slow water movement	0.68	Very limited Seepage	1.00



# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2090: Rizzo-----	20	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
2091: Deprave-----	60	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage	1.00 1.00
Roostertail-----	15	Very limited Filtering capacity Depth to cemented pan	1.00 0.47	Very limited Seepage Depth to cemented pan	1.00 0.05
2100: Perurose-----	50	Very limited Depth to cemented pan Filtering capacity	1.00 1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.08
Coxpin-----	25	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.32
Pintobasin, gravelly surface---	15	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
2101: Perurose, rarely flooded-----	60	Very limited Depth to cemented pan Filtering capacity Flooding	1.00 1.00 0.40	Very limited Depth to cemented pan Seepage Flooding	1.00 1.00 0.40
Pintobasin, rarely flooded-----	35	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
2110: Descent-----	80	Very limited Filtering capacity Slope Large stones	1.00 1.00 0.05	Very limited Slope Seepage Large stones	1.00 1.00 0.56
Descent, stable-----	15	Very limited Filtering capacity Large stones	1.00 0.04	Very limited Seepage Large stones Slope	1.00 0.49 0.32

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2111: Descent, warm-----	45	Very limited Filtering capacity Slope Large stones	1.00 1.00 0.05	Very limited Slope Seepage Large stones	1.00 1.00 0.56
Rubylee, very rarely flooded-----	40	Very limited Filtering capacity Slope	1.00 0.63	Very limited Slope Seepage	1.00 1.00
2120: Rizzo, rarely flooded-----	35	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Slope Flooding	1.00 0.68 0.40
Deprave-----	35	Very limited Depth to cemented pan Filtering capacity	1.00 1.00	Very limited Depth to cemented pan Seepage	1.00 1.00
Rizzo, frequently flooded-----	20	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
2121: Rizzo, rubbly-----	90	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 1.00
2130: Goldenbell-----	55	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage	1.00 1.00
Descent-----	40	Very limited Filtering capacity Slope Large stones	1.00 0.63 0.03	Very limited Seepage Slope Large stones	1.00 1.00 0.36
2140: Rockhound, cobbly---	85	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 1.00
2402: Rizzo-----	70	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2402: Rizzo, frequently flooded-----	20	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
2403: Rizzo-----	80	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
Rizzo, occasionally flooded-----	15	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
2404: Rizzo, occasionally flooded-----	60	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.32
Rizzo, very rarely flooded-----	35	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 0.32 0.20
2405: Carrizo, rarely flooded-----	65	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40
Carrizo, occasionally flooded-----	25	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
2406: Pintobasin, frequently flooded-	50	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
Carrizo, occasionally flooded-----	40	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2407:					
Pintobasin, rarely flooded-----	45	Very limited Filtering capacity Flooding	1.00  0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
Carrizo, occasionally flooded-----	30	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
Carrizo, frequently flooded-----	20	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
2408:					
Rizzo, frequently flooded-----	55	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
Rizzo, very rarely flooded-----	35	Very limited Filtering capacity Flooding	1.00  0.20	Very limited Seepage Flooding Slope	1.00 0.20 0.08
2409:					
Rizzo, frequently flooded-----	35	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.32
Chemwash, frequently flooded-	30	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.32
Carsitas, occasionally flooded, braided---	25	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.32
2420:					
Carsitas, frequently flooded-	45	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2420: Carsitas, occasionally flooded-----	40	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.32
Carsitas, rarely flooded-----	15	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40
2421: Carsitas, very rarely flooded-----	55	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 0.68 0.20
Carsitas, rarely flooded-----	25	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Slope Flooding	1.00 0.92 0.40
2431: Chemwash, frequently flooded, braided---	60	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.68
Chemwash, frequently flooded-	25	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.92
2440: Rizzo-----	35	Very limited Filtering capacity Slope	1.00 0.16	Very limited Slope Seepage	1.00 1.00
Rizzo, occasionally flooded-----	30	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Slope Seepage	1.00 1.00 1.00
Rizzo, extremely stony-----	15	Very limited Filtering capacity Slope	1.00 0.63	Very limited Slope Seepage	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2715:					
Dalelake-----	35	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.92
Sheephole-----	30	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Pintobasin-----	25	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
2716:					
Dalelake, steep----	75	Very limited Filtering capacity	1.00	Very limited Slope Seepage	1.00 1.00
Dalelake-----	20	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.92
2717:					
Dalelake-----	40	Very limited Filtering capacity Slope	1.00 0.16	Very limited Slope Seepage	1.00 1.00
Rock outcrop-----	25	Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
2718:					
Dalelake-----	55	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Sheephole, gravelly surface-----	45	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
2820:					
Rock outcrop-----	60	Not rated		Not rated	
Impedimenta-----	25	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
2825:					
Rock outcrop-----	35	Not rated		Not rated	
Supplymine-----	25	Very limited Depth to bedrock Slope Slow water movement Large stones	1.00 1.00 0.50 0.06	Very limited Depth to hard bedrock Slope Seepage Large stones	1.00 1.00 1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Tble 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2825:					
Bolero, dry-----	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
				Large stones	0.04
Ironage-----	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
				Large stones	0.09
2830:					
Rock outcrop-----	80	Not rated		Not rated	
Blackeagle, cool----	10	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
		Large stones	0.50	Slope	1.00
				Seepage	1.00
				Large stones	1.00
2835:					
Rock outcrop-----	40	Not rated		Not rated	
Blackeagle-----	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
2840:					
Rock outcrop-----	65	Not rated		Not rated	
Jadestorm-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Depth to soft	1.00
				bedrock	
				Slope	1.00
				Seepage	0.02
3110:					
Coppermine, cool----	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	0.02
Stranger-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	0.96	bedrock	
				Slope	1.00



# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3120:					
Aguilareal-----	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
Blackeagle-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
Rock outcrop-----	15	Not rated		Not rated	
3213:					
Dalvord-----	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
Aguilareal-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
Rock outcrop-----	25	Not rated		Not rated	
3242:					
Langwell-----	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
Rock outcrop-----	25	Not rated		Not rated	
Helendale, cool-----	20	Very limited		Very limited	
		Filtering	1.00	Seepage	1.00
		capacity		Slope	0.68
3285:					
Pinecity-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
Contactmine-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
		Slow water	0.98	Slope	1.00
		movement		Seepage	0.02
Desertqueen-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	0.02
Rock outcrop-----	15	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3286: Pinecity, gravelly loamy sand-----	85	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
3291: Smithcanyon-----	40	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
Stubbespring-----	25	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated	
3292: Smithcanyon-----	35	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
Pinecity-----	25	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Rock outcrop-----	25	Not rated		Not rated	
3293: Smithcanyon-----	50	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
Pinecity-----	25	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
3294: Smithcanyon, dry----	80	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02
3295: Desertqueen, dry----	40	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.02

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3295:					
Hexie-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
		Filtering	1.00	Slope	1.00
		capacity		Seepage	1.00
Rock outcrop-----	20	Not rated		Not rated	
3296:					
Desertqueen-----	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
				Large stones	0.02
Pinecity-----	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
3297:					
Desertqueen, warm---	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	0.02
Contactmine, dry----	20	Very limited		Very limited	
		Filtering	1.00	Seepage	1.00
		capacity		Slope	1.00
		Slope	1.00	Depth to soft	0.71
		Depth to bedrock	0.89	bedrock	
Seanna, dry-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Seepage	1.00
				Slope	1.00
3325:					
Ironped, warm-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	0.02
Rock outcrop-----	20	Not rated		Not rated	
Hexie-----	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
		Filtering	1.00	Slope	1.00
		capacity		Seepage	1.00
Ironped-----	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	0.02

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3335:					
Xeric Torriorthents-	40	Very limited		Very limited	
		Filtering	1.00	Slope	1.00
		capacity		Seepage	1.00
		Slope	1.00	Depth to soft	0.46
		Depth to bedrock	0.79	bedrock	
Rock outcrop-----	25	Not rated		Not rated	
Xeric					
Torriorthents, warm	25	Very limited		Very limited	
		Filtering	1.00	Slope	1.00
		capacity		Seepage	1.00
		Slope	1.00	Depth to soft	0.46
		Depth to bedrock	0.79	bedrock	
3336:					
Xeric Torriorthents-	45	Very limited		Very limited	
		Filtering	1.00	Slope	1.00
		capacity		Seepage	1.00
		Slope	1.00	Depth to soft	0.46
		Depth to bedrock	0.79	bedrock	
Bigbernie-----	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
3340:					
Seanna-----	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
Grubstake, moist----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Depth to soft	1.00
				bedrock	
				Slope	1.00
				Seepage	1.00
Pinecity-----	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
3345:					
Bigcanyon-----	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00
Bigcanyon, cool-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3440: Pacific Mesa, steep-	65	Very limited Depth to bedrock Slope Large stones	1.00 1.00 0.17	Very limited Depth to hard bedrock Slope Seepage Large stones	1.00 1.00 1.00 1.00 0.93
Pacific Mesa-----	30	Very limited Depth to bedrock Large stones	1.00 0.18	Very limited Depth to hard bedrock Slope Seepage Large stones	1.00 1.00 1.00 1.00 0.94
3509: Cajon, very rarely flooded-----	60	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 0.68 0.20
Friedliver-----	20	Somewhat limited Slow water movement	0.50	Very limited Seepage Slope	1.00 0.32
3525: Cajon-----	70	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 0.32 0.20
Friedliver-----	15	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
3526: Cajon-----	40	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
Hypoint-----	35	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Arizo, occasionally flooded-----	15	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
3611: Burntshack, sand surface-----	50	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Burntshack-----	35	Very limited Filtering capacity	1.00	Very limited Slope Seepage	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3612: Burntshack-----	75	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
Burntshack, occasionally flooded-----	20	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
3676: Morongo, loamy sand, very rarely flooded-----	80	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Flooding	1.00 0.20
3677: Morongo-----	80	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
3679: Morongo, cool-----	55	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Jumborox-----	20	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
3680: Morongo-----	85	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
3681: Morongo, very rarely flooded-----	45	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 0.32 0.20
Jumborox, dry-----	35	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
3682: Morongo, cool-----	50	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Jumborox-----	15	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 1.00
Urban land-----	15	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3683: Morongo-----	55	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
Bluecut, very rarely flooded----	30	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
3684: Morongo, warm-----	85	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.92
3685: Morongo, cool-----	65	Very limited Filtering capacity Slope	1.00 0.63	Very limited Slope Seepage	1.00 1.00
Desertqueen, undulating-----	15	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
3690: Nasagold-----	85	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
3695: Gocougs-----	80	Very limited Depth to cemented pan Slow water movement	1.00 0.98	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.32
4031: Crosgrain-----	50	Very limited Depth to cemented pan Slope	1.00 1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
Crackerjack-----	30	Very limited Depth to cemented pan Slope	1.00 1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
Pinkcan, dry-----	15	Somewhat limited Slow water movement Depth to cemented pan	0.98 0.88	Very limited Seepage Slope Depth to cemented pan	1.00 0.92 0.68



# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4041: Silvermine-----	40	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
Helendale-----	30	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Burntshack, very rarely flooded-----	20	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Flooding	1.00 0.20
4064: Gravesumit-----	55	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Helendale, sandy surface-----	35	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
4071: Helendale-----	65	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 1.00
Desertqueen, very rarely flooded-----	15	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 1.00
4091: Littlefargo-----	85	Very limited Depth to bedrock Filtering capacity Slope	1.00 1.00 0.16	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 1.00
4245: Bluecut-----	40	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 1.00
Morongo, very rarely flooded-----	25	Very limited Filtering capacity Flooding	1.00 0.20	Very limited Seepage Slope Flooding	1.00 0.32 0.20

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4245: Yander, very rarely flooded-----	15	Very limited Filtering capacity Depth to bedrock Flooding	1.00 1.00 0.20	Very limited Depth to soft bedrock Seepage Slope Flooding	1.00 1.00 0.32 0.20
4260: Minhoyt-----	45	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Slope	1.00 0.32
Corbilt, rarely flooded-----	40	Very limited Filtering capacity Depth to cemented pan Flooding	1.00 0.73 0.40	Very limited Seepage Flooding Depth to cemented pan	1.00 0.40 0.32
4265: Werewolf, warm-----	80	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.92
4270: Yuccabutte, extremely cobbly sandy loam-----	95	Very limited Slope Slow water movement Large stones	1.00 0.68 0.43	Very limited Slope Seepage Large stones	1.00 1.00 1.00
4271: Yuccabutte, warm----	60	Very limited Filtering Capacity	1.00	Very limited Seepage Slope	1.00 0.92
Arizo, rarely flooded-----	30	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Slope Flooding	1.00 0.68 0.40
4275: Pinkcan-----	35	Somewhat limited Slow water movement Depth to cemented pan	0.98 0.88	Very limited Seepage Depth to cemented pan	1.00 0.68
Werewolf-----	25	Very limited Filtering capacity	1.00	Very limited Seepage	1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4275: Gocougs, warm-----	15	Very limited Depth to cemented pan Slow water movement	1.00  0.68	Very limited Depth to cemented pan Slope Seepage	1.00  0.32 0.32
4280: Mekkadale-----	55	Very limited Depth to cemented pan Slope	1.00  1.00	Very limited Depth to cemented pan Seepage Slope	1.00  1.00 1.00
Edalph, warm-----	25	Very limited Filtering capacity Slope	1.00  1.00	Very limited Slope Seepage	1.00 1.00
4285: Typic Argidurids----	35	Very limited Depth to cemented pan Slope	1.00  1.00	Very limited Depth to cemented pan Slope Seepage	1.00  1.00 0.02
Coppermine-----	30	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00  1.00 0.02
Minhoyt, warm-----	25	Very limited Depth to cemented pan Slope	1.00  0.63	Very limited Depth to cemented pan Slope	1.00  1.00
4403: Arizo, rarely flooded, channeled-	50	Very limited Filtering capacity Flooding	1.00  0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.32
Arizo, rarely flooded-----	25	Very limited Filtering capacity Flooding	1.00  0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.32
Arizo-----	20	Very limited Filtering capacity	1.00	Very limited Seepage Slope Large stones	1.00 0.68 0.02
4440: Dragonwash, occasionally flooded-----	55	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4440: Dragonwash, frequently flooded-----	35	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
4450: Morongo, occasionally flooded-----	75	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
Morongo, frequently flooded-----	15	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.08
4605: Pinecity, moist-----	80	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 0.68
4606: Pinecity-----	60	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Rock outcrop-----	25	Not rated		Not rated	
4607: Pinecity-----	85	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
4608: Pinecity-----	60	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Rock outcrop-----	30	Not rated		Not rated	
4610: Desertqueen-----	35	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 0.68
Jumborox, warm-----	25	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.92
Rock outcrop-----	20	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4615: Desertqueen, cool---	45	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 1.00
Jumborox-----	25	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Rock outcrop-----	15	Not rated		Not rated	
4620: Stranger-----	40	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
Rock outcrop-----	35	Not rated		Not rated	
Grubstake, moist----	20	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 1.00 1.00
4625: Grinder-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Slope	1.00 0.68
Grinder, cool-----	20	Very limited Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00 1.00
Pinkcan, cool-----	15	Somewhat limited Slow water movement Depth to cemented pan	0.98 0.88	Very limited Seepage Slope Depth to cemented pan	1.00 1.00 0.68
4630: Thunderclap-----	50	Somewhat limited Depth to bedrock	0.12	Very limited Seepage Slope	1.00 0.92
Smithcanyon-----	30	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00 1.00

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4804:					
Rock outcrop-----	45	Not rated		Not rated	
Ironped-----	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	0.02
Pinecity-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope		bedrock	
				Slope	1.00
4805:					
Rock outcrop-----	50	Not rated		Not rated	
Ironped, cool-----	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00
				Seepage	0.02
4806:					
Rock outcrop-----	90	Not rated		Not rated	
4811:					
Rock outcrop-----	85	Not rated		Not rated	
Pioneertown-----	10	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
		Slope	1.00	bedrock	
				Slope	1.00
4825:					
Rock outcrop-----	30	Not rated		Not rated	
Grubstake-----	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
				bedrock	
				Depth to soft	1.00
				bedrock	
				Seepage	1.00
				Slope	0.08
Cajon, rarely flooded-----	20	Very limited		Very limited	
		Filtering	1.00	Seepage	1.00
		capacity		Flooding	0.40
		Flooding	0.40	Slope	0.32
Stranger, warm-----	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard	1.00
				bedrock	
4830:					
Rock outcrop-----	80	Not rated		Not rated	
Pinecity, cool-----	10	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft	1.00
		Slope	1.00	bedrock	
				Slope	1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4900: Rock outcrop-----	65	Not rated		Not rated	
Aguilareal-----	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00
Lostpalms-----	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.02	Large stones	0.51



# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1220:							
Jadestorm-----	60	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage Too sandy	1.00 1.00 1.00 1.00 1.00
Blackeagle, cool----	20	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage	1.00 1.00 1.00 1.00
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1225:							
Blackeagle-----	65	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage	1.00 1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1230:							
Jadestorm-----	45	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage	1.00 1.00 1.00 1.00
Jadestorm, cool----	20	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage Too sandy	1.00 1.00 1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1240:							
Meccapass-----	45	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage	1.00 1.00 1.00 1.00
Bulletproof-----	20	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 0.50	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	1.00 1.00 1.00 0.50 0.01
Rock outcrop-----	10	Not rated		Not rated		Not rated	

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1241:							
Meccapass-----	45	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage	1.00 1.00 1.00 1.00
Seanna-----	20	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage	1.00 1.00 1.00
Contactmine, dry----	20	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock	1.00 1.00
1242:							
Meccapass-----	40	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage	1.00 1.00 1.00 1.00
Jadestorm-----	25	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage Too sandy	1.00 1.00 1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1250:							
Ironlung-----	50	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	1.00 1.00 1.00 1.00 0.93
Ironlung, cool-----	20	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	1.00 1.00 1.00 1.00 0.98
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1255:							
Goldenhills-----	40	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 0.50	Very limited Slope	1.00	Very limited Slope Seepage Gravel content Depth to bedrock Too sandy	1.00 1.00 0.85 0.68 0.50
Bulletproof-----	15	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 0.50	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy	1.00 1.00 1.00 0.50

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1255:							
Fanhill-----	15	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Gravel content	1.00 1.00 1.00 0.96
Whiterobe-----	15	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	1.00 1.00 1.00 1.00 0.19
1260:							
Whiterobe-----	45	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	1.00 1.00 1.00 1.00 0.12
Bigbernie-----	20	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	1.00 1.00 1.00 1.00 0.48
Whiterobe, cool----	15	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	1.00 1.00 1.00 1.00 0.12
1410:							
Missionwell-----	50	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage Too sandy	1.00 1.00 1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Missionwell, high elevation-----	15	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage Too sandy	1.00 1.00 1.00 1.00 1.00
1415:							
Bolero-----	60	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Gravel content	1.00 1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1504:							
Rizzo, rarely flooded, stony-----	50	Very limited Too sandy Flooding Slope	 1.00 0.40 0.04	Somewhat limited Flooding Slope	 0.40 0.04	Very limited Seepage Too sandy Gravel content Slope	 1.00 1.00 0.97 0.04
Rizzo, occasionally flooded, stony-----	35	Very limited Flooding Too sandy Slope	 1.00 1.00 0.63	Very limited Flooding Slope	 1.00 0.63	Very limited Seepage Too sandy Gravel content Slope	 1.00 1.00 0.97 0.63
1510:							
Carrizo, very gravelly sandy loam	85	Very limited Too sandy	 1.00	Not limited		Very limited Seepage Too sandy Gravel content	 1.00 1.00 1.00
1511:							
Carrizo, channeled--	75	Very limited Too sandy Flooding	 1.00 0.40	Somewhat limited Flooding	 0.40	Very limited Seepage Too sandy Gravel content	 1.00 1.00 1.00
Carrizo, occasionally flooded-----	15	Very limited Flooding Too sandy	 1.00 1.00	Very limited Flooding	 1.00	Very limited Seepage Too sandy Gravel content	 1.00 1.00 1.00
1512:							
Carrizo, extremely gravelly sandy loam	80	Somewhat limited Too sandy	 0.50	Not limited		Very limited Seepage Gravel content Too sandy	 1.00 1.00 0.50
1513:							
Carrizo-----	60	Very limited Too sandy	 1.00	Not limited		Very limited Seepage Too sandy Gravel content	 1.00 1.00 1.00
Carrizo, occasionally flooded, channeled-	20	Very limited Flooding Too sandy	 1.00 1.00	Very limited Flooding	 1.00	Very limited Seepage Too sandy Gravel content	 1.00 1.00 1.00
Rubylee-----	15	Somewhat limited Too sandy	 0.50	Not limited		Very limited Seepage Too sandy Gravel content	 1.00 0.50 0.15

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1514: Carrizo, rarely flooded-----	40	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.99
Pintobasin, fine sandy loam-----	30	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50
Rubylee-----	15	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy Gravel content	1.00 0.50 0.15
1515: Pintobasin-----	80	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
Carrizo, occasionally flooded-----	15	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
1516: Pintobasin, fine sandy loam-----	90	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50
1517: Pintobasin-----	65	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
Dalelake-----	25	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
1520: Pintobasin, loamy sand-----	80	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy	1.00 1.00
1522: Pintobasin, rarely flooded-----	85	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1523:							
Pintobasin, rarely flooded-----	50	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
Aquapeak-----	25	Somewhat limited Depth to thin cemented pan	0.50	Not limited		Very limited Depth to cemented pan	1.00
Pintobasin, occasionally flooded-----	20	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
1524:							
Pintobasin, rarely flooded-----	90	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
1525:							
Pintobasin, occasionally flooded-----	45	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
Pintobasin, rarely flooded-----	35	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy	1.00 1.00
1526:							
Pintobasin, rarely flooded-----	55	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy	1.00 1.00
Joetree-----	20	Somewhat limited Too sandy Flooding	0.50 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy	1.00 0.50
Patscamp-----	15	Not limited		Not limited		Not limited	
1527:							
Pintobasin, moist---	90	Very limited Too sandy Slope	1.00 0.37	Somewhat limited Slope	0.37	Very limited Seepage Too sandy Slope	1.00 1.00 0.37
1530:							
Dalelake, fine sand-	85	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1531: Dalelake-----	60	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Pintobasin, rarely flooded-----	30	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
1540: Carrizo, very rarely flooded-----	35	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Carrizo, stable-----	25	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Carrizo, occasionally flooded, rocky surface-----	20	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.99
Russiroks-----	20	Not limited		Not limited		Very limited Gravel content Seepage	1.00 1.00
1541: Carrizo, stable-----	50	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Cambidic Haplodurids	40	Very limited Depth to thick cemented pan Too sandy	1.00 0.50	Not limited		Very limited Depth to cemented pan Seepage Gravel content Too sandy	1.00 1.00 1.00 0.50
1542: Carrizo, very rarely flooded-----	70	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Carrizo, occasionally flooded-----	20	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00



Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1550: Buzzardsprings, stable-----	35	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.18
Coxpin-----	25	Somewhat limited Too sandy Depth to thin cemented pan	0.50 0.50	Not limited		Very limited Depth to cemented pan Seepage Too sandy Gravel content	1.00 1.00 0.50 0.01
Dalelake-----	20	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
1555: Goldrose-----	35	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.79
Carsitas, very rarely flooded----	30	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.03
Chemwash, rarely flooded-----	25	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
2003: Emptygun-----	100	Very limited Slope Too sandy	1.00 0.50	Very limited Slope	1.00	Very limited Slope Seepage Gravel content Too sandy	1.00 1.00 0.65 0.50
2060: Joetree, very rarely flooded----	35	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy	1.00 1.00
Dalelake-----	30	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Pintobasin, fine sandy loam-----	25	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2065:							
Dalelake-----	30	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Aquapeak-----	25	Somewhat limited Depth to thin cemented pan	0.50	Not limited		Very limited Depth to cemented pan Gravel content	1.00 0.11
Coxpin-----	25	Somewhat limited Too sandy Depth to thin cemented pan	0.50 0.50	Not limited		Very limited Depth to cemented pan Seepage Too sandy Gravel content	1.00 1.00 0.50 0.01
2067:							
Aquapeak, overblown-	30	Somewhat limited Depth to thin cemented pan	0.50	Not limited		Very limited Depth to cemented pan	1.00
Buzzardsprings-----	25	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.08
Dalelake, thick sandy surface-----	20	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Buzzardsprings, steep-----	15	Very limited Slope Too sandy	1.00 1.00	Very limited Slope	1.00	Very limited Slope Seepage Too sandy Gravel content	1.00 1.00 1.00 0.09
2068:							
Aquapeak-----	45	Somewhat limited Depth to thin cemented pan	0.50	Not limited		Very limited Depth to cemented pan	1.00
Carpetflat, nongravelly surface	35	Very limited Depth to thick cemented pan Too sandy	1.00 1.00	Not limited		Very limited Depth to cemented pan Seepage Too sandy Gravel content	1.00 1.00 1.00 0.12
Pintobasin-----	15	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2070:							
Missionsweet-----	60	Very limited Depth to thick cemented pan Slope	1.00  0.84	Somewhat limited Slope	0.84	Very limited Depth to cemented pan Gravel content Seepage Slope	1.00  1.00 1.00 0.84
Carpetflat-----	25	Very limited Depth to thick cemented pan	1.00	Not limited		Very limited Depth to cemented pan Seepage Gravel content	1.00  1.00 0.99
2075:							
Oldale-----	50	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Gravel content Too sandy	1.00  0.99 0.50
Missionsweet-----	30	Very limited Depth to thick cemented pan Slope	1.00  0.84	Somewhat limited Slope	0.84	Very limited Depth to cemented pan Gravel content Seepage Slope	1.00  1.00 1.00 0.84
2076:							
Oldale-----	40	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Gravel content Too sandy	1.00  0.99 0.50
Carrizo-----	30	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00  1.00 1.00
2077:							
Oldale-----	50	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Gravel content Too sandy	1.00  0.92 0.50
Carrizo-----	25	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00  1.00 1.00
Carrizo, very rarely flooded-----	15	Very limited Too sandy Flooding	1.00  0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy Gravel content	1.00  1.00 1.00
2085:							
Rainbowsend-----	45	Very limited Depth to thick cemented pan Slope Large stones	1.00  1.00 0.04	Very limited Slope	1.00	Very limited Depth to cemented pan Seepage Slope Gravel content Large stones	1.00  1.00 1.00 0.80 0.04

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2085: Goldenbell-----	35	Very limited Depth to thick cemented pan	1.00	Not limited		Very limited Depth to cemented pan Gravel content	1.00 1.00
2090: Deprave-----	35	Very limited Depth to thick cemented pan Too sandy	1.00 0.50	Not limited		Very limited Depth to cemented pan Gravel content Seepage Too sandy	1.00 1.00 1.00 0.50
Rockhound-----	25	Not limited		Not limited		Very limited Gravel content Seepage	1.00 1.00
Rizzo-----	20	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.98
2091: Deprave-----	60	Very limited Depth to thick cemented pan Too sandy	1.00 0.50	Not limited		Very limited Depth to cemented pan Gravel content Seepage Too sandy	1.00 1.00 1.00 0.50
Roostertail-----	15	Very limited Too sandy Depth to thick cemented pan	1.00 1.00	Not limited		Very limited Seepage Too sandy Gravel content Depth to cemented pan	1.00 1.00 1.00 0.05
2100: Perurose-----	50	Very limited Too sandy Depth to thin cemented pan	1.00 0.50	Not limited		Very limited Depth to cemented pan Seepage Too sandy	1.00 1.00 1.00
Coxpin-----	25	Somewhat limited Too sandy Depth to thin cemented pan	0.50 0.50	Not limited		Very limited Depth to cemented pan Seepage Too sandy	1.00 1.00 0.50
Pintobasin, gravelly surface---	15	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
2101: Perurose, rarely flooded-----	60	Very limited Too sandy Depth to thin cemented pan Flooding	1.00 0.50 0.40	Somewhat limited Flooding	0.40	Very limited Depth to cemented pan Seepage Too sandy	1.00 1.00 1.00

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2101: Pintobasin, rarely flooded-----	35	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
2110: Descent-----	80	Very limited Too sandy Slope Large stones	1.00 1.00 0.06	Very limited Slope	1.00	Very limited Seepage Too sandy Slope Gravel content Large stones	1.00 1.00 1.00 0.99 0.06
Descent, stable----	15	Very limited Too sandy Large stones	1.00 0.06	Not limited		Very limited Seepage Too sandy Gravel content Large stones	1.00 1.00 0.99 0.06
2111: Descent, warm-----	45	Very limited Slope Too sandy Large stones	1.00 1.00 0.06	Very limited Slope	1.00	Very limited Slope Seepage Too sandy Gravel content Large stones	1.00 1.00 1.00 0.99 0.06
Rubylee, very rarely flooded-----	40	Somewhat limited Slope Too sandy	0.63 0.50	Somewhat limited Slope	0.63	Very limited Seepage Slope Too sandy Gravel content	1.00 0.63 0.50 0.15
2120: Rizzo, rarely flooded-----	35	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.97
Deprave-----	35	Very limited Depth to thick cemented pan Too sandy	1.00 0.50	Not limited		Very limited Depth to cemented pan Gravel content Seepage Too sandy	1.00 1.00 1.00 0.50
Rizzo, frequently flooded-----	20	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
2121: Rizzo, rubbly-----	90	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.97

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2130: Goldenbell-----	55	Very limited Depth to thick cemented pan	1.00	Not limited		Very limited Depth to cemented pan Gravel content	1.00 1.00
Descent-----	40	Very limited Too sandy Slope Large stones	1.00 0.63 0.05	Somewhat limited Slope	0.63	Very limited Seepage Too sandy Gravel content Slope Large stones	1.00 1.00 0.99 0.63 0.05
2140: Rockhound, cobbly---	85	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
2402: Rizzo-----	70	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.97
Rizzo, frequently flooded-----	20	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.98
2403: Rizzo-----	80	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.97
Rizzo, occasionally flooded-----	15	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
2404: Rizzo, occasionally flooded-----	60	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.97
Rizzo, very rarely flooded-----	35	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.97
2405: Carrizo, rarely flooded-----	65	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.99

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2405: Carrizo, occasionally flooded-----	25	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
2406: Pintobasin, frequently flooded-	50	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.03
Carrizo, occasionally flooded-----	40	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
2407: Pintobasin, rarely flooded-----	45	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
Carrizo, occasionally flooded-----	30	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Carrizo, frequently flooded-----	20	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
2408: Rizzo, frequently flooded-----	55	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Rizzo, very rarely flooded-----	35	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.97
2409: Rizzo, frequently flooded-----	35	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00



Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2409: Chemwash, frequently flooded---	30	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Carsitas, occasionally flooded, braided---	25	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.03
2420: Carsitas, frequently flooded---	45	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.03
Carsitas, occasionally flooded-----	40	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.03
Carsitas, rarely flooded-----	15	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
2421: Carsitas, very rarely flooded-----	55	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.03
Carsitas, rarely flooded-----	25	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.02
2431: Chemwash, frequently flooded, braided---	60	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Chemwash, frequently flooded---	25	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2440:							
Rizzo-----	35	Very limited Too sandy Slope	1.00 0.16	Somewhat limited Slope	0.16	Very limited Seepage Too sandy Gravel content Slope	1.00 1.00 1.00 0.16
Rizzo, occasionally flooded-----	30	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Rizzo, extremely stony-----	15	Very limited Too sandy Slope	1.00 0.63	Somewhat limited Slope	0.63	Very limited Seepage Too sandy Gravel content Slope	1.00 1.00 0.98 0.63
2715:							
Dalelake-----	35	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Sheephole-----	30	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Pintobasin-----	25	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.01
2716:							
Dalelake, steep-----	75	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Dalelake-----	20	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
2717:							
Dalelake-----	40	Very limited Too sandy Slope	1.00 0.16	Somewhat limited Slope	0.16	Very limited Seepage Too sandy Slope	1.00 1.00 0.16
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.05

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2718:							
Dalelake-----	55	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Sheephole, gravelly surface-----	45	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
2820:							
Rock outcrop-----	60	Not rated		Not rated		Not rated	
Impedimenta-----	25	Very limited Depth to bedrock Slope Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Depth to bedrock Seepage Slope Too sandy Gravel content	1.00 1.00 1.00 1.00 0.09
2825:							
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Supplymine-----	25	Very limited Slope Depth to bedrock Large stones	1.00 1.00 0.06	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Large stones	1.00 1.00 0.27 0.06
Bolero, dry-----	15	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Gravel content	1.00 1.00 1.00 1.00
Ironage-----	15	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage	1.00 1.00 1.00 1.00
2830:							
Rock outcrop-----	80	Not rated		Not rated		Not rated	
Blackeagle, cool----	10	Very limited Slope Depth to bedrock Large stones	1.00 1.00 0.50	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Large stones Gravel content	1.00 1.00 1.00 0.50 0.37
2835:							
Rock outcrop-----	40	Not rated		Not rated		Not rated	
Blackeagle-----	40	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Gravel content Seepage	1.00 1.00 1.00 1.00

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2840:							
Rock outcrop-----	65	Not rated		Not rated		Not rated	
Jadestorm-----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too sandy	1.00			Gravel content	1.00
						Seepage	1.00
						Too sandy	1.00
3110:							
Coppermine, cool----	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Gravel content	0.99
Stranger-----	30	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.96	Depth to bedrock	1.00
		Too sandy	1.00			Seepage	1.00
		Slope	0.96			Too sandy	1.00
						Slope	0.96
3120:							
Aguilareal-----	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Seepage	1.00
						Gravel content	0.90
Blackeagle-----	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Gravel content	1.00
						Seepage	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
3213:							
Dalvord-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Gravel content	1.00
						Seepage	1.00
Aguilareal-----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Seepage	1.00
						Gravel content	0.88
Rock outcrop-----	25	Not rated		Not rated		Not rated	
3242:							
Langwell-----	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Seepage	1.00
						Slope	1.00
						Gravel content	0.55
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Helendale, cool----	20	Not limited		Not limited		Very limited	
						Seepage	1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3285: Pinecity-----	30	Very limited Slope Depth to bedrock Too sandy	 1.00 1.00 0.50	Very limited Slope	 1.00	Very limited Slope Depth to bedrock Seepage Too sandy	 1.00 1.00 1.00 0.50
Contactmine-----	20	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Slope	 1.00	Very limited Slope Depth to bedrock Gravel content	 1.00 1.00 0.01
Desertqueen-----	20	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Slope	 1.00	Very limited Slope Depth to bedrock Seepage	 1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
3286: Pinecity, gravelly loamy sand-----	85	Very limited Slope Depth to bedrock Too sandy	 1.00 1.00 0.50	Very limited Slope	 1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	 1.00 1.00 1.00 0.50 0.03
3291: Smithcanyon-----	40	Very limited Slope Depth to bedrock Too sandy	 1.00 1.00 0.50	Very limited Slope	 1.00	Very limited Slope Depth to bedrock Seepage Too sandy	 1.00 1.00 1.00 0.50
Stubbespring-----	25	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Slope	 1.00	Very limited Slope Depth to bedrock Seepage	 1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3292: Smithcanyon-----	35	Very limited Slope Depth to bedrock Too sandy	 1.00 1.00 0.50	Very limited Slope	 1.00	Very limited Slope Depth to bedrock Seepage Too sandy	 1.00 1.00 1.00 0.50
Pinecity-----	25	Very limited Slope Depth to bedrock Too sandy	 1.00 1.00 0.50	Very limited Slope	 1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	 1.00 1.00 1.00 0.50 0.06
Rock outcrop-----	25	Not rated		Not rated		Not rated	

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3293:							
Smithcanyon-----	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too sandy	0.50			Seepage	1.00
						Too sandy	0.50
						Gravel content	0.15
Pinecity-----	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too sandy	0.50			Seepage	1.00
						Too sandy	0.50
						Gravel content	0.06
3294:							
Smithcanyon, dry----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too sandy	0.50			Seepage	1.00
						Gravel content	0.79
						Too sandy	0.50
3295:							
Desertqueen, dry----	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Seepage	1.00
Hexie-----	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Seepage	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3296:							
Desertqueen-----	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Seepage	1.00
Pinecity-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too sandy	1.00			Seepage	1.00
						Too sandy	1.00
3297:							
Desertqueen, warm---	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Seepage	1.00
						Slope	1.00
Contactmine, dry----	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Seepage	1.00
		Slope	1.00			Slope	1.00
						Depth to bedrock	0.71

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3297: Seanna, dry-----	20	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Slope	1.00	Very limited Depth to bedrock Seepage Slope	1.00 1.00 1.00
3325: Ironped, warm-----	30	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy	1.00 1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Hexie-----	15	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage	1.00 1.00 1.00
Ironped-----	15	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy	1.00 1.00 1.00 1.00
3335: Xeric Torriorthents-	40	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 0.50	Very limited Slope	1.00	Very limited Slope Seepage Gravel content Too sandy Depth to bedrock	1.00 1.00 1.00 0.50 0.46
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Xeric Torriorthents, warm	25	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 0.50	Very limited Slope	1.00	Very limited Slope Seepage Gravel content Too sandy Depth to bedrock	1.00 1.00 1.00 0.50 0.46
3336: Xeric Torriorthents-	45	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 0.50	Very limited Slope	1.00	Very limited Slope Seepage Gravel content Too sandy Depth to bedrock	1.00 1.00 1.00 0.50 0.46
Bigbernie-----	25	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy Gravel content	1.00 1.00 1.00 1.00 0.48



Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3340:							
Seanna-----	35	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Gravel content	1.00 1.00 1.00 0.57
Grubstake, moist----	20	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage	1.00 1.00 1.00
Pinecity-----	15	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 0.50	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy	1.00 1.00 1.00 0.50
3345:							
Bigcanyon-----	55	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy	1.00 1.00 1.00 1.00
Bigcanyon, cool----	20	Very limited Slope Depth to bedrock Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Too sandy	1.00 1.00 1.00 1.00
3440:							
Pacific Mesa, steep-	65	Very limited Slope Depth to bedrock Large stones	1.00 1.00 0.17	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage Large stones Gravel content	1.00 1.00 1.00 0.17 0.07
Pacific Mesa-----	30	Very limited Depth to bedrock Large stones	1.00 0.18	Not limited		Very limited Depth to bedrock Seepage Large stones Gravel content	1.00 1.00 0.18 0.01
3509:							
Cajon, very rarely flooded-----	60	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.32
Friedliver-----	20	Not limited		Not limited		Somewhat limited Gravel content	0.44
3525:							
Cajon-----	70	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.11

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3525: Friedliver-----	15	Somewhat limited Too sandy Flooding	0.50 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy	1.00 0.50
3526: Cajon-----	40	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.13
Hypoint-----	35	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.42
Arizo, occasionally flooded-----	15	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
3611: Burntshack, sand surface-----	50	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50
Burntshack-----	35	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50
3612: Burntshack-----	75	Not limited		Not limited		Very limited Seepage	1.00
Burntshack, occasionally flooded-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Seepage	1.00
3676: Morongo, loamy sand, very rarely flooded-----	80	Somewhat limited Too sandy Flooding	0.50 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy	1.00 0.50
3677: Morongo-----	80	Very limited Too sandy	1.00	Not limited		Very limited Too sandy Seepage	1.00 1.00
3679: Morongo, cool-----	55	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50
Jumborox-----	20	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3680: Morongo-----	85	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
3681: Morongo, very rarely flooded-----	45	Very limited Too sandy Flooding	1.00 0.20	Somewhat limited Flooding	0.20	Very limited Too sandy Seepage	1.00 1.00
Jumborox, dry-----	35	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50
3682: Morongo, cool-----	50	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50
Jumborox-----	15	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Urban land-----	15	Not rated		Not rated		Not rated	
3683: Morongo-----	55	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.15
Bluecut, very rarely flooded-----	30	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.16
3684: Morongo, warm-----	85	Very limited Too sandy	1.00	Not limited		Very limited Too sandy Seepage Gravel content	1.00 1.00 0.01
3685: Morongo, cool-----	65	Somewhat limited Slope Too sandy	0.63 0.50	Somewhat limited Slope	0.63	Very limited Seepage Slope Too sandy	1.00 0.63 0.50
Desertqueen, undulating-----	15	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Slope	1.00	Very limited Depth to bedrock Seepage Slope	1.00 1.00 1.00
3690: Nasagold-----	85	Not limited		Not limited		Very limited Seepage	1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3695: Gocougs-----	80	Somewhat limited Depth to thin cemented pan	0.50	Not limited		Very limited Depth to cemented pan	1.00
4031: Crosgrain-----	50	Very limited Depth to thick cemented pan Slope	1.00 1.00	Very limited Slope	1.00	Very limited Depth to cemented pan Seepage Slope Gravel content	1.00 1.00 1.00 0.99
Crackerjack-----	30	Very limited Depth to thick cemented pan Slope	1.00 1.00	Very limited Slope	1.00	Very limited Depth to cemented pan Seepage Slope Gravel content	1.00 1.00 1.00 0.59
Pinkcan, dry-----	15	Very limited Depth to thick cemented pan	1.00	Not limited		Very limited Seepage Depth to cemented pan	1.00 0.68
4041: Silvermine-----	40	Very limited Depth to thick cemented pan Too sandy	1.00 0.50	Not limited		Very limited Depth to cemented pan Seepage Too sandy	1.00 1.00 0.50
Helendale-----	30	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 0.05
Burntshack, very rarely flooded-----	20	Somewhat limited Too sandy Flooding	0.50 0.20	Somewhat limited Flooding	0.20	Very limited Seepage Too sandy	1.00 0.50
4064: Gravesumit-----	55	Not limited		Not limited		Very limited Seepage	1.00
Helendale, sandy surface-----	35	Not limited		Not limited		Very limited Seepage	1.00
4071: Helendale-----	65	Not limited		Not limited		Very limited Seepage	1.00
Desertqueen, very rarely flooded-----	15	Very limited Depth to bedrock Slope Too sandy	1.00 0.63 0.50	Somewhat limited Slope	0.63	Very limited Depth to bedrock Seepage Slope Too sandy Gravel content	1.00 1.00 0.63 0.50 0.05

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4091:							
Littlefargo-----	85	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.16	Depth to bedrock	1.00
		Slope	0.16			Seepage	1.00
						Slope	0.16
Rock outcrop-----	10	Not rated		Not rated		Not rated	
4245:							
Bluecut-----	40	Somewhat limited		Not limited		Very limited	
		Too sandy	0.50			Seepage	1.00
						Too sandy	0.50
Morongo, very rarely flooded-----	25	Very limited		Somewhat limited		Very limited	
		Too sandy	1.00	Flooding	0.20	Too sandy	1.00
		Flooding	0.20			Seepage	1.00
Yander, very rarely flooded-----	15	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Flooding	0.20	Seepage	1.00
		Too sandy	1.00			Too sandy	1.00
		Flooding	0.20			Depth to bedrock	0.99
						Gravel content	0.01
4260:							
Minhoyt-----	45	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
		Too sandy	1.00			Seepage	1.00
						Too sandy	1.00
Corbilt, rarely flooded-----	40	Somewhat limited		Somewhat limited		Very limited	
		Depth to thin cemented pan	0.50	Flooding	0.40	Seepage	1.00
		Flooding	0.40			Depth to cemented pan	0.32
4265:							
Werewolf, warm-----	80	Somewhat limited		Not limited		Very limited	
		Too sandy	0.50			Seepage	1.00
						Gravel content	0.99
						Too sandy	0.50
4270:							
Yuccabutte-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Seepage	1.00
						Slope	1.00
						Gravel content	0.18
4271:							
Yuccabutte, warm----	60	Not limited		Not limited		Very limited	
						Seepage	1.00
						Gravel content	0.57
Arizo, rarely flooded-----	30	Very limited		Somewhat limited		Very limited	
		Too sandy	1.00	Flooding	0.40	Seepage	1.00
		Flooding	0.40			Too sandy	1.00
						Gravel content	0.74

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4275:							
Pinkcan-----	35	Very limited Depth to thick cemented pan	1.00	Not limited		Very limited Seepage Depth to cemented pan	1.00 0.68
Werewolf-----	25	Not limited		Not limited		Very limited Seepage Gravel content	1.00 0.06
Gocougs, warm-----	15	Somewhat limited Depth to thin cemented pan	0.50	Not limited		Very limited Depth to cemented pan Gravel content	1.00 0.15
4280:							
Mekkadale-----	55	Very limited Slope Depth to thin cemented pan	1.00 0.50	Very limited Slope	1.00	Very limited Depth to cemented pan Slope	1.00 1.00
Edalph, warm-----	25	Very limited Slope Too sandy	1.00 0.50	Very limited Slope	1.00	Very limited Slope Seepage Too sandy Gravel content	1.00 1.00 0.50 0.02
4285:							
Typic Argidurids----	35	Very limited Depth to thick cemented pan Slope	1.00 1.00	Very limited Slope	1.00	Very limited Depth to cemented pan Gravel content Slope	1.00 1.00 1.00
Coppermine-----	30	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Slope	1.00	Very limited Depth to bedrock Gravel content Slope	1.00 1.00 1.00
Minhoyt, warm-----	25	Very limited Depth to thick cemented pan Slope	1.00 0.63	Somewhat limited Slope	0.63	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.63
4403:							
Arizo, rarely flooded, channeled-	50	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Arizo, rarely flooded-----	25	Very limited Too sandy Flooding	1.00 0.40	Somewhat limited Flooding	0.40	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
Arizo-----	20	Very limited Too sandy	1.00	Not limited		Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4440: Dragonwash, occasionally flooded-----	55	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 0.99
Dragonwash, frequently flooded-	35	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy Gravel content	1.00 1.00 1.00
4450: Morongo, occasionally flooded-----	75	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Seepage Too sandy	1.00 1.00
Morongo, frequently flooded-----	15	Very limited Flooding Too sandy	1.00 1.00	Very limited Flooding	1.00	Very limited Too sandy Seepage Gravel content	1.00 1.00 0.23
4605: Pinecity, moist-----	80	Very limited Depth to bedrock Too sandy	1.00 0.50	Not limited		Very limited Depth to bedrock Seepage Too sandy	1.00 1.00 0.50
4606: Pinecity-----	60	Very limited Depth to bedrock Slope Too sandy	1.00 1.00 0.50	Very limited Slope	1.00	Very limited Depth to bedrock Seepage Slope Too sandy	1.00 1.00 1.00 0.50
Rock outcrop-----	25	Not rated		Not rated		Not rated	
4607: Pinecity-----	85	Very limited Depth to bedrock Too sandy	1.00 1.00	Not limited		Very limited Depth to bedrock Seepage Too sandy	1.00 1.00 1.00
4608: Pinecity-----	60	Very limited Depth to bedrock Too sandy	1.00 0.50	Not limited		Very limited Depth to bedrock Seepage Too sandy	1.00 1.00 0.50
Rock outcrop-----	30	Not rated		Not rated		Not rated	
4610: Desertqueen-----	35	Very limited Depth to bedrock Too sandy	1.00 0.50	Not limited		Very limited Depth to bedrock Seepage Too sandy Gravel content	1.00 1.00 0.50 0.05



Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4610: Jumborox, warm-----	25	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy Gravel content	1.00 0.50 0.02
Rock outcrop-----	20	Not rated		Not rated		Not rated	
4615: Desertqueen, cool---	45	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope	1.00	Very limited Slope Depth to bedrock Seepage	1.00 1.00 1.00
Jumborox-----	25	Somewhat limited Too sandy	0.50	Not limited		Very limited Seepage Too sandy	1.00 0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	
4620: Stranger-----	40	Very limited Depth to bedrock Slope Too sandy	1.00 1.00 1.00	Very limited Slope	1.00	Very limited Depth to bedrock Seepage Slope Too sandy	1.00 1.00 1.00 1.00
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Grubstake, moist---	20	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Slope	1.00	Very limited Depth to bedrock Seepage Slope	1.00 1.00 1.00
4625: Grinder-----	50	Very limited Depth to bedrock	1.00	Not limited		Very limited Depth to bedrock Seepage Gravel content	1.00 1.00 0.37
Grinder, cool-----	20	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Slope	1.00	Very limited Depth to bedrock Slope Seepage Gravel content	1.00 1.00 1.00 0.41
Pinkcan, cool-----	15	Very limited Depth to thick cemented pan	1.00	Not limited		Very limited Seepage Depth to cemented pan	1.00 0.68
4630: Thunderclap-----	50	Very limited Too sandy Depth to bedrock	1.00 1.00	Not limited		Very limited Seepage Too sandy	1.00 1.00
Smithcanyon-----	30	Very limited Depth to bedrock Too sandy Slope	1.00 1.00 0.16	Somewhat limited Slope	0.16	Very limited Depth to bedrock Seepage Too sandy Slope	1.00 1.00 1.00 0.16

Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4804:							
Rock outcrop-----	45	Not rated		Not rated		Not rated	
Ironped-----	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too sandy	0.50			Seepage	1.00
						Too sandy	0.50
						Gravel content	0.05
Pinecity-----	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too sandy	0.50			Seepage	1.00
						Too sandy	0.50
4805:							
Rock outcrop-----	50	Not rated		Not rated		Not rated	
Ironped, cool-----	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Seepage	1.00
		Too sandy	0.50			Slope	1.00
						Too sandy	0.50
						Gravel content	0.05
4806:							
Rock outcrop-----	90	Not rated		Not rated		Not rated	
4811:							
Rock outcrop-----	85	Not rated		Not rated		Not rated	
Pioneertown-----	10	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too sandy	1.00			Seepage	1.00
						Too sandy	1.00
						Gravel content	0.79
4825:							
Rock outcrop-----	30	Not rated		Not rated		Not rated	
Grubstake-----	20	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Seepage	1.00
Cajon, rarely flooded-----	20	Very limited		Somewhat limited		Very limited	
		Too sandy	1.00	Flooding	0.40	Seepage	1.00
		Flooding	0.40			Too sandy	1.00
						Gravel content	0.32
Stranger, warm-----	15	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too sandy	1.00			Seepage	1.00
						Too sandy	1.00

# Soil Survey of Joshua Tree National Park, California

Table 16.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4830:							
Rock outcrop-----	80	Not rated		Not rated		Not rated	
Pinecity, cool-----	10	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Seepage	1.00
		Too sandy	0.50			Slope	1.00
						Too sandy	0.50
4900:							
Rock outcrop-----	65	Not rated		Not rated		Not rated	
Aguilareal-----	15	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Seepage	1.00
						Slope	1.00
						Gravel content	0.92
Lostpalms-----	15	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Seepage	1.00
		Too sandy	0.50			Slope	1.00
		Large stones	0.02			Too sandy	0.50
						Large stones	0.02

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1220:					
Jadestorm-----	60	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.38	Bottom layer	0.09
Blackeagle, cool----	20	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.10	Bottom layer	0.06
Rock outcrop-----	10	Not rated		Not rated	
1225:					
Blackeagle-----	65	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.10	Bottom layer	0.06
Rock outcrop-----	15	Not rated		Not rated	
1230:					
Jadestorm-----	45	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.38	Bottom layer	0.09
Jadestorm, cool----	20	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.38	Bottom layer	0.09
Rock outcrop-----	15	Not rated		Not rated	
1240:					
Meccapass-----	45	Fair		Poor	
		Bottom layer	0.28	Bottom layer	0.00
		Thickest layer	0.28	Thickest layer	0.00
Bulletproof-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.15
Rock outcrop-----	10	Not rated		Not rated	
1241:					
Meccapass-----	45	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.28	Thickest layer	0.00
Seanna-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Contactmine, dry----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1242:					
Meccapass-----	40	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.28	Thickest layer	0.00
Jadestorm-----	25	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.38	Bottom layer	0.09
Rock outcrop-----	15	Not rated		Not rated	
1250:					
Ironlung-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.86
Ironlung, cool-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.95
Rock outcrop-----	15	Not rated		Not rated	
1255:					
Goldenhills-----	40	Fair		Fair	
		Thickest layer	0.09	Bottom layer	0.09
		Bottom layer	0.09	Thickest layer	0.09
Bulletproof-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
Fanhill-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.15
Whiterobe-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.07
		Thickest layer	0.00	Bottom layer	0.38
1260:					
Whiterobe-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.07
		Thickest layer	0.00	Bottom layer	0.38
Bigbernie-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.27
		Thickest layer	0.00	Bottom layer	0.38
Whiterobe, cool-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.07
		Thickest layer	0.00	Bottom layer	0.38
1410:					
Missionwell-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop-----	20	Not rated		Not rated	
Missionwell, high elevation-----	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1415: Bolero-----	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Rock outcrop-----	20	Not rated		Not rated	
1504: Rizzo, rarely flooded, stony-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.11
		Thickest layer	0.00	Bottom layer	0.60
Rizzo, occasionally flooded, stony-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.11
		Thickest layer	0.00	Bottom layer	0.60
1510: Carrizo, very gravelly sandy loam	85	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.28	Bottom layer	0.33
1511: Carrizo, channeled--	75	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.60	Bottom layer	0.33
Carrizo, occasionally flooded-----	15	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.60	Bottom layer	0.33
1512: Carrizo, extremely gravelly sandy loam	80	Fair		Fair	
		Thickest layer	0.28	Bottom layer	0.10
		Bottom layer	0.30	Thickest layer	0.29
1513: Carrizo-----	60	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.28	Bottom layer	0.33
Carrizo, occasionally flooded, channeled-	20	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.28	Bottom layer	0.33
Rubylee-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.07
1514: Carrizo, rarely flooded-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.14
		Thickest layer	0.00	Bottom layer	0.27

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1514: Pintobasin, fine sandy loam-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.04 0.10
Rubylee-----	15	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.07
1515: Pintobasin-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58
Carrizo, occasionally flooded-----	15	Fair Thickest layer Bottom layer	0.18 0.60	Fair Thickest layer Bottom layer	0.19 0.33
1516: Pintobasin, fine sandy loam-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.04 0.10
1517: Pintobasin-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58
Dalelake-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.27 0.27
1520: Pintobasin, loamy Sand-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.38 0.44
1522: Pintobasin, rarely flooded-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58
1523: Pintobasin, rarely flooded-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58
Aquapeak-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.38
Pintobasin, occasionally flooded-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58



# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1524: Pintobasin, rarely flooded-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58
1525: Pintobasin, occasionally flooded-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58
Pintobasin, rarely flooded-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.38 0.44
1526: Pintobasin, rarely flooded-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58
Joetree-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.10 0.10
Patscamp-----	15	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.07
1527: Pintobasin, moist---	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.38 0.44
1530: Dalelake, fine sand-	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.27 0.27
1531: Dalelake-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.35 0.35
Pintobasin, rarely flooded-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58
1540: Carrizo, very rarely flooded-----	35	Fair Thickest layer Bottom layer	0.18 0.28	Fair Thickest layer Bottom layer	0.19 0.33
Carrizo, stable-----	25	Fair Thickest layer Bottom layer	0.18 0.28	Fair Thickest layer Bottom layer	0.19 0.33

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1540: Carrizo, occasionally flooded, rocky surface-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.14
		Thickest layer	0.00	Bottom layer	0.27
Russiroks-----	20	Fair		Fair	
		Thickest layer	0.20	Thickest layer	0.07
		Bottom layer	0.28	Bottom layer	0.08
1541: Carrizo, stable----	50	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.28	Bottom layer	0.33
Cambidic Haplodurids	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.08
1542: Carrizo, very rarely flooded-----	70	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.28	Bottom layer	0.33
Carrizo, occasionally flooded-----	20	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.60	Bottom layer	0.33
1550: Buzzardsprings, stable-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.09
		Thickest layer	0.00	Bottom layer	0.75
Coxpin-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.38
Dalelake-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.27
		Thickest layer	0.00	Thickest layer	0.27
1555: Goldrose-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.51
		Thickest layer	0.00	Bottom layer	0.95
Carsitas, very rarely flooded-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.38
		Thickest layer	0.00	Thickest layer	0.38
Chemwash, rarely flooded-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.15
		Thickest layer	0.00	Bottom layer	0.69

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2003:					
Emptygun-----	100	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.10
2060:					
Joetree, very rarely flooded----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.38
Dalelake-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.27
		Thickest layer	0.00	Thickest layer	0.27
Pintobasin, fine sandy loam-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.10
2065:					
Dalelake-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.27
		Thickest layer	0.00	Thickest layer	0.27
Aquapeak-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.38
Coxpin-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.38
2067:					
Aquapeak, overblown-	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.38
Buzzardsprings-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.51
		Thickest layer	0.00	Bottom layer	0.75
Dalelake, thick sandy surface-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.35
		Thickest layer	0.00	Thickest layer	0.35
Buzzardsprings, steep-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.51
		Thickest layer	0.00	Bottom layer	0.75
2068:					
Aquapeak-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.38
Carpetflat, nongravelly surface	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.75

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2068:					
Pintobasin-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.44
		Thickest layer	0.00	Bottom layer	0.58
2070:					
Missionsweet-----	60	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.10	Thickest layer	0.00
Carpetflat-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
2075:					
Oldale-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.09
Missionsweet-----	30	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.10	Thickest layer	0.00
2076:					
Oldale-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.09
Carrizo-----	30	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.28	Bottom layer	0.33
2077:					
Oldale-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.09
Carrizo-----	25	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.28	Bottom layer	0.33
Carrizo, very rarely flooded-----	15	Fair		Fair	
		Thickest layer	0.18	Thickest layer	0.19
		Bottom layer	0.28	Bottom layer	0.33
2085:					
Rainbowsend-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Goldenbell-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.86
2090:					
Deprave-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.10
		Thickest layer	0.00	Bottom layer	0.82
Rockhound-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2090: Rizzo-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.11
		Thickest layer	0.00	Bottom layer	0.60
2091: Deprave-----	60	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.82
Roostertail-----	15	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.18
		Thickest layer	0.00	Thickest layer	0.56
2100: Perurose-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.75
Coxpin-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.01
Pintobasin, gravelly surface---	15	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.38
		Thickest layer	0.00	Thickest layer	0.44
2101: Perurose, rarely flooded-----	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.75
Pintobasin, rarely flooded-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.44
		Thickest layer	0.00	Bottom layer	0.58
2110: Descent-----	80	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.08
		Bottom layer	0.14	Bottom layer	0.14
Descent, stable-----	15	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.08
		Bottom layer	0.14	Bottom layer	0.14
2111: Descent, warm-----	45	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.08
		Bottom layer	0.14	Bottom layer	0.14
Rubylee, very rarely flooded-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.07

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2120: Rizzo, rarely flooded-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60
Deprave-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.10 0.82
Rizzo, frequently flooded-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60
2121: Rizzo, rubbly-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60
2130: Goldenbell-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.86
Descent-----	40	Fair Thickest layer Bottom layer	0.00 0.14	Fair Thickest layer Bottom layer	0.08 0.14
2140: Rockhound, cobbly---	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.38
2402: Rizzo-----	70	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60
Rizzo, frequently flooded-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60
2403: Rizzo-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60
Rizzo, occasionally flooded-----	15	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60
2404: Rizzo, occasionally flooded-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2404: Rizzo, very rarely flooded-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60
2405: Carrizo, rarely flooded-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.14 0.27
Carrizo, occasionally flooded-----	25	Fair Thickest layer Bottom layer	0.18 0.60	Fair Thickest layer Bottom layer	0.19 0.33
2406: Pintobasin, frequently flooded-	50	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.75 0.89
Carrizo, occasionally flooded-----	40	Fair Thickest layer Bottom layer	0.18 0.60	Fair Thickest layer Bottom layer	0.19 0.33
2407: Pintobasin, rarely flooded-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.44 0.58
Carrizo, occasionally flooded-----	30	Fair Thickest layer Bottom layer	0.18 0.60	Fair Thickest layer Bottom layer	0.19 0.33
Carrizo, frequently flooded-----	20	Fair Thickest layer Bottom layer	0.18 0.60	Fair Thickest layer Bottom layer	0.19 0.33
2408: Rizzo, frequently flooded-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60
Rizzo, very rarely flooded-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.11 0.60



# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2409:					
Rizzo, frequently flooded-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.11
		Thickest layer	0.00	Bottom layer	0.60
Chemwash, frequently flooded-	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.61
		Thickest layer	0.00	Bottom layer	0.69
Carsitas, occasionally flooded, braided---	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.12
		Thickest layer	0.00	Bottom layer	0.38
2420:					
Carsitas, frequently flooded-	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.38
		Thickest layer	0.00	Thickest layer	0.38
Carsitas, occasionally flooded-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.38
		Thickest layer	0.00	Thickest layer	0.38
Carsitas, rarely flooded-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.07
		Thickest layer	0.00	Bottom layer	0.38
2421:					
Carsitas, very rarely flooded-----	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.38
Carsitas, rarely flooded-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.07
		Thickest layer	0.00	Bottom layer	0.38
2431:					
Chemwash, frequently flooded, braided---	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.61
		Thickest layer	0.00	Bottom layer	0.69
Chemwash, frequently flooded-	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.61
		Thickest layer	0.00	Bottom layer	0.69
2440:					
Rizzo-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.11
		Thickest layer	0.00	Bottom layer	0.60

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2440:					
Rizzo, occasionally flooded-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.11
		Thickest layer	0.00	Bottom layer	0.60
Rizzo, extremely stony-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.11
		Thickest layer	0.00	Bottom layer	0.60
2715:					
Dalelake-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.27
		Thickest layer	0.00	Thickest layer	0.27
Sheephole-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.19
		Thickest layer	0.00	Bottom layer	0.27
Pintobasin-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.44
		Thickest layer	0.00	Bottom layer	0.58
2716:					
Dalelake, steep-----	75	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.27
		Thickest layer	0.00	Thickest layer	0.27
Dalelake-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.27
		Thickest layer	0.00	Thickest layer	0.27
2717:					
Dalelake-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.27
		Thickest layer	0.00	Thickest layer	0.27
Rock outcrop-----	25	Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.51
		Thickest layer	0.00	Bottom layer	0.75
2718:					
Dalelake-----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.27
		Thickest layer	0.00	Thickest layer	0.27
Sheephole, gravelly surface-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.19
		Thickest layer	0.00	Bottom layer	0.27
2820:					
Rock outcrop-----	60	Not rated		Not rated	
Impedimenta-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.58

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2825:					
Rock outcrop-----	35	Not rated		Not rated	
Supplymine-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bolero, dry-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Ironage-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
2830:					
Rock outcrop-----	80	Not rated		Not rated	
Blackeagle, cool----	10	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.10	Bottom layer	0.06
2835:					
Rock outcrop-----	40	Not rated		Not rated	
Blackeagle-----	40	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
2840:					
Rock outcrop-----	65	Not rated		Not rated	
Jadestorm-----	30	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.38	Bottom layer	0.09
3110:					
Coppermine, cool----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stranger-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.75
3120:					
Aguilareal-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Blackeagle-----	20	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Rock outcrop-----	15	Not rated		Not rated	
3213:					
Dalvord-----	35	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.60	Thickest layer	0.00

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3213: Aguilareal-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Rock outcrop-----	25	Not rated		Not rated	
3242: Langwell-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.08
Rock outcrop-----	25	Not rated		Not rated	
Helendale, cool-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.05
3285: Pinecity-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.08
Contactmine-----	20	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.15	Thickest layer	0.00
Desertqueen-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Rock outcrop-----	15	Not rated		Not rated	
3286: Pinecity, gravelly loamy sand-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.08
3291: Smithcanyon-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Stubbespring-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop-----	20	Not rated		Not rated	
3292: Smithcanyon-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
Pinecity-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
Rock outcrop-----	25	Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3293: Smithcanyon-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
Pinecity-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
3294: Smithcanyon, dry----	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
3295: Desertqueen, dry----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Hexie-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.03
Rock outcrop-----	20	Not rated		Not rated	
3296: Desertqueen-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.07
Pinecity-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.44
3297: Desertqueen, warm----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Contactmine, dry----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Seanna, dry-----	20	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
3325: Ironped, warm-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.63
Rock outcrop-----	20	Not rated		Not rated	
Hexie-----	15	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.07
		Thickest layer	0.00	Thickest layer	0.07
Ironped-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.63

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3335: Xeric Torriorthents-	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.09
		Thickest layer	0.00	Bottom layer	0.38
Rock outcrop-----	25	Not rated		Not rated	
Xeric Torriorthents, warm	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.09
		Thickest layer	0.00	Bottom layer	0.38
3336: Xeric Torriorthents-	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.09
		Thickest layer	0.00	Bottom layer	0.38
Bigbernie-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.27
		Thickest layer	0.00	Bottom layer	0.38
3340: Seanna-----	35	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Grubstake, moist----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.03
Pinecity-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.09
3345: Bigcanyon-----	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.68
Bigcanyon, cool----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.10
		Thickest layer	0.00	Bottom layer	0.38
3440: Pacific Mesa, steep-	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pacific Mesa-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3509: Cajon, very rarely flooded-----	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.12
		Thickest layer	0.00	Bottom layer	0.86
Friedliver-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3525: Cajon-----	70	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.82
		Thickest layer	0.00	Bottom layer	0.89
Friedliver-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.10
3526: Cajon-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.10
		Thickest layer	0.00	Bottom layer	0.93
Hypoint-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.28
		Thickest layer	0.00	Bottom layer	0.51
Arizo, occasionally flooded-----	15	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.37
		Thickest layer	0.00	Thickest layer	0.37
3611: Burntshack, sand surface-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.12
		Thickest layer	0.00	Thickest layer	0.20
Burntshack-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.12
		Thickest layer	0.00	Thickest layer	0.20
3612: Burntshack-----	75	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.07
		Thickest layer	0.00	Thickest layer	0.28
Burntshack, occasionally flooded-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.07
		Thickest layer	0.00	Thickest layer	0.28
3676: Morongo, loamy sand, very rarely flooded-----	80	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.08
3677: Morongo-----	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.71
		Thickest layer	0.00	Bottom layer	0.86
3679: Morongo, cool-----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.10



# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3679: Jumborox-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.10
3680: Morongo-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.68
		Thickest layer	0.00	Bottom layer	0.86
3681: Morongo, very rarely flooded-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.71
		Thickest layer	0.00	Bottom layer	0.86
Jumborox, dry-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.10
3682: Morongo, cool-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.10
Jumborox-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.09
		Thickest layer	0.00	Bottom layer	0.38
Urban land-----	15	Not rated		Not rated	
3683: Morongo-----	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.10
		Thickest layer	0.00	Bottom layer	0.39
Bluecut, very rarely flooded-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.10
3684: Morongo, warm-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.75
		Thickest layer	0.00	Bottom layer	0.91
3685: Morongo, cool-----	65	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.10
Desertqueen, undulating-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
3690: Nasagold-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.07
		Thickest layer	0.00	Bottom layer	0.08

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3695: Gocougs-----	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.61
4031: Crosgrain-----	50	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.22	Thickest layer	0.00
Crackerjack-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Pinkcan, dry-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.08
4041: Silvermine-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
Helendale-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.82
Burntshack, very rarely flooded-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.07
		Thickest layer	0.00	Thickest layer	0.10
4064: Gravesumit-----	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.86
Helendale, sandy surface-----	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.05
4071: Helendale-----	65	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.05
Desertqueen, very rarely flooded-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.15
4091: Littlefargo-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.06
		Thickest layer	0.00	Thickest layer	0.05
4245: Bluecut-----	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.12
		Thickest layer	0.00	Thickest layer	0.15

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4245: Morongo, very rarely flooded-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.71 0.86
Yander, very rarely flooded-----	15	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.08 0.47
4260: Minhoys-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Corbitt, rarely flooded-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.04 0.10
4265: Werewolf, warm-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.10
4270: Yuccabutte, extremely cobbly sandy loam-----	95	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.04 0.10
4271: Yuccabutte, warm----	60	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.10 0.09
Arizo, rarely flooded-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.10 0.75
4275: Pinkcan-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.08
Werewolf-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.03 0.09
Gocougs, warm-----	15	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.01 0.08
4280: Mekkadale-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.08

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4280: Edalph, warm-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.13
4285: Typic Argidurids----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Coppermine-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Minhoyt, warm-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
4403: Arizo, rarely flooded, channeled-	50	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.26
		Bottom layer	0.18	Bottom layer	0.26
Arizo, rarely flooded-----	25	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.26
		Bottom layer	0.18	Bottom layer	0.26
Arizo-----	20	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.02
		Bottom layer	0.18	Bottom layer	0.26
4440: Dragonwash, occasionally flooded-----	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.75
		Thickest layer	0.00	Thickest layer	0.75
Dragonwash, frequently flooded-	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.75
		Thickest layer	0.00	Thickest layer	0.75
4450: Morongo, occasionally flooded-----	75	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.38
		Thickest layer	0.00	Thickest layer	0.86
Morongo, frequently flooded-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.51
		Thickest layer	0.00	Bottom layer	0.91
4605: Pinecity, moist-----	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.11

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4606: Pinecity-----	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
Rock outcrop-----	25	Not rated		Not rated	
4607: Pinecity-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.44
4608: Pinecity-----	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
Rock outcrop-----	30	Not rated		Not rated	
4610: Desertqueen-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.15
Jumborox, warm-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.10
		Thickest layer	0.00	Bottom layer	0.75
Rock outcrop-----	20	Not rated		Not rated	
4615: Desertqueen, cool---	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Jumborox-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.10
		Thickest layer	0.00	Thickest layer	0.10
Rock outcrop-----	15	Not rated		Not rated	
4620: Stranger-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.75
Rock outcrop-----	35	Not rated		Not rated	
Grubstake, moist----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.07
4625: Grinder-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.07
Grinder, cool-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.07

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4625: Pinkcan, cool-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.08
4630: Thunderclap-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.60
		Thickest layer	0.00	Bottom layer	0.89
Smithcanyon-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.38
4804: Rock outcrop-----	45	Not rated		Not rated	
Ironped-----	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.08
Pinecity-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
4805: Rock outcrop-----	50	Not rated		Not rated	
Ironped, cool-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.08
4806: Rock outcrop-----	90	Not rated		Not rated	
4811: Rock outcrop-----	85	Not rated		Not rated	
Pioneertown-----	10	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.12
4825: Rock outcrop-----	30	Not rated		Not rated	
Grubstake-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.07
Cajon, rarely flooded-----	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.12
		Thickest layer	0.00	Bottom layer	0.86
Stranger, warm-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.75

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part I—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4830:					
Rock outcrop-----	80	Not rated		Not rated	
Pinecity, cool-----	10	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
4900:					
Rock outcrop-----	65	Not rated		Not rated	
Aguilareal-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Lostpalms-----	15	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04



# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1220: Jadestorm-----	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
		Too sandy	0.32			Too sandy	0.32
Blackeagle, cool----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
		Too sandy	0.08			Too sandy	0.08
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1225: Blackeagle-----	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
		Too sandy	0.96			Too sandy	0.96
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1230: Jadestorm-----	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.12			Slope	0.00
		Too sandy	0.96			Too sandy	0.96
Jadestorm, cool----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
		Too sandy	0.32			Too sandy	0.32
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1240: Meccapass-----	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Low content of organic matter	0.03	Slope	0.00	Slope	0.00
		Depth to bedrock	0.96			Depth to bedrock	0.96

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1240: Bulletproof-----	20	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00	Slope	0.00	Slope	0.00
		Depth to bedrock	0.00			Too sandy	0.00
		Low content of organic matter	0.03			Rock fragments	0.86
Rock outcrop-----	10	Not rated		Not rated		Not rated	
1241: Meccapass-----	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.03	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.26			Depth to bedrock	0.26
Seanna-----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12			Rock fragments	0.18
Contactmine, dry----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.03	Slope	0.00	Depth to bedrock	0.14
		Depth to bedrock	0.14			Rock fragments	0.65
1242: Meccapass-----	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.03	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.26			Depth to bedrock	0.26
Jadestorm-----	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
		Too sandy	0.32			Too sandy	0.32
Rock outcrop-----	15	Not rated		Not rated		Not rated	
1250: Ironlung-----	50	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Wind erosion	0.00	Slope	0.00	Depth to bedrock	0.00
		Droughty	0.00			Slope	0.00
		Depth to bedrock	0.00			Too sandy	0.00
		Low content of organic matter	0.03				
Ironlung, cool-----	20	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Wind erosion	0.00	Slope	0.00	Depth to bedrock	0.00
		Droughty	0.00			Slope	0.00
		Depth to bedrock	0.00			Too sandy	0.00
		Low content of organic matter	0.03				

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1250: Rock outcrop-----	15	Not rated		Not rated		Not rated	
1255: Goldenhills-----	40	Poor		Poor		Poor	
		Droughty	0.00	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.03	Depth to bedrock	0.32	Slope	0.00
		Too sandy	0.22			Hard to reclaim (rock fragments)	0.00
						Too sandy	0.22
Bulletproof-----	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.03			Too sandy	0.22
		Too sandy	0.22				
Fanhill-----	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.03			Rock fragments	0.00
Whiterobe-----	15	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.00	Slope	0.00	Too sandy	0.00
		Too alkaline	0.00			Depth to bedrock	0.18
		Low content of organic matter	0.03			Rock fragments	0.88
		Depth to bedrock	0.18				
1260: Whiterobe-----	45	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.00	Slope	0.00	Too sandy	0.00
		Too alkaline	0.00			Depth to bedrock	0.12
		Low content of organic matter	0.03			Rock fragments	0.88
		Depth to bedrock	0.12				
Bigbernie-----	20	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Slope	0.00
		Wind erosion	0.00	Slope	0.00	Too sandy	0.00
		Droughty	0.00	Stones	0.54	Rock fragments	0.00
		Low content of organic matter	0.03			Depth to bedrock	0.08
		Depth to bedrock	0.08				
Whiterobe, cool-----	15	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.00	Slope	0.00	Too sandy	0.00
		Too alkaline	0.00			Depth to bedrock	0.12
		Low content of organic matter	0.03			Rock fragments	0.88
		Depth to bedrock	0.12				

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1410: Missionwell-----	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Missionwell, high elevation-----	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.50	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
1415: Bolero-----	60	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Droughty	0.00	Slope	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Cobble content	0.92	Slope	0.00
		Low content of organic matter	0.12			Too sandy	0.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
1504: Rizzo, rarely flooded, stony-----	50	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.00			(rock fragments)	
		Water erosion	0.99			Slope	0.96
Rizzo, occasionally flooded, stony-----	35	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.00			(rock fragments)	
						Slope	0.37
1510: Carrizo, very gravelly sandy loam	85	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.12			Hard to reclaim	0.00
						(rock fragments)	
1511: Carrizo, channeled--	75	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.03			(rock fragments)	

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1511: Carrizo, occasionally flooded-----	15	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.00
1512: Carrizo, extremely gravelly sandy loam	80	Poor		Fair		Poor	
		Too sandy	0.00	Cobble content	0.98	Hard to reclaim (rock fragments)	0.00
		Droughty	0.00			Rock fragments	0.00
		Low content of organic matter	0.03			Too sandy	0.00
1513: Carrizo-----	60	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.00
Carrizo, occasionally flooded, channeled-	20	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.12			Hard to reclaim (rock fragments)	0.00
Rubylee-----	15	Fair		Good		Poor	
		Low content of organic matter	0.03			Rock fragments	0.00
		Droughty	0.14			Too sandy	0.44
		Too sandy	0.44			Hard to reclaim (rock fragments)	0.61
1514: Carrizo, rarely flooded-----	40	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim (rock fragments)	0.00
		Low content of organic matter	0.03				
Pintobasin, fine sandy loam-----	30	Fair		Good		Fair	
		Too sandy	0.01			Too sandy	0.01
		Low content of organic matter	0.03				
		Droughty	0.61				
Rubylee-----	15	Fair		Good		Poor	
		Low content of organic matter	0.03			Rock fragments	0.00
		Droughty	0.14			Too sandy	0.44
		Too sandy	0.44			Hard to reclaim (rock fragments)	0.61

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1515: Pintobasin-----	80	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.02
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.97
		Droughty	0.08				
Carrizo, occasionally flooded-----	15	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.00
1516: Pintobasin, fine sandy loam-----	90	Fair		Good		Fair	
		Too sandy	0.01			Too sandy	0.01
		Low content of organic matter	0.03				
		Droughty	0.61				
1517: Pintobasin-----	65	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.02
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.97
		Droughty	0.08				
Dalelake-----	25	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of organic matter	0.03				
		Droughty	0.32				
1520: Pintobasin, loamy sand-----	80	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.18
		Low content of organic matter	0.03				
		Droughty	0.03				
1522: Pintobasin, rarely flooded-----	85	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.02
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.97
		Droughty	0.08				

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1523: Pintobasin, rarely flooded-----	50	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.08	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.02 0.97
Aquapeak-----	25	Poor Wind erosion Droughty Depth to cemented pan Too alkaline Low content of organic matter	 0.00 0.00 0.00  0.00 0.03	Poor Depth to cemented pan	0.00	Poor Depth to cemented pan Rock fragments	 0.00 0.82
Pintobasin, occasionally flooded-----	20	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.08	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.02 0.97
1524: Pintobasin, rarely flooded-----	90	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.08	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.02 0.97
1525: Pintobasin, occasionally flooded-----	45	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.08	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.02 0.97
Pintobasin, rarely flooded-----	35	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.03	Good		Poor Too sandy Rock fragments	 0.00 0.18
1526: Pintobasin, rarely flooded-----	55	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.10	Good		Poor Too sandy Rock fragments	 0.00 0.96



# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1526: Joetree-----	20	Poor Too sandy Wind erosion Low content of organic matter	 0.00 0.00 0.03	Good		Poor Too sandy	 0.00
Patscamp-----	15	Poor Wind erosion Too alkaline Low content of organic matter Water erosion	 0.00 0.00 0.03 0.99	Good		Poor Rock fragments	 0.00
1527: Pintobasin, moist---	90	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.03	Good		Poor Too sandy Rock fragments Slope	 0.00 0.18 0.63
1530: Dalelake, fine sand-	85	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.32	Good		Poor Too sandy	 0.00
1531: Dalelake-----	60	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.12 0.32	Good		Poor Too sandy	 0.00
Pintobasin, rarely flooded-----	30	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.08	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.02 0.97
1540: Carrizo, very rarely flooded-----	35	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.12	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
Carrizo, stable-----	25	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1540: Carrizo, occasionally flooded, rocky surface-----	20	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
Russiroks-----	20	Poor Droughty Too alkaline Low content of organic matter Too sandy	 0.00 0.00 0.03 0.78	Good		Poor Hard to reclaim (rock fragments) Rock fragments Too sandy	 0.00  0.00 0.78
1541: Carrizo, stable-----	50	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
Cambidic Haplodurids	40	Poor Too sandy Droughty Depth to cemented pan Low content of organic matter	 0.00 0.00 0.00 0.03	Poor Depth to cemented pan	0.00	Poor Rock fragments Depth to cemented pan Too sandy	 0.00 0.00 0.00
1542: Carrizo, very rarely flooded-----	70	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.12	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
Carrizo, occasionally flooded-----	20	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
1550: Buzzardsprings, stable-----	35	Fair Low content of organic matter Droughty Too sandy	 0.03 0.04 0.08	Good		Fair Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.08 0.24 0.26

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1550: Coxpin-----	25	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to cemented	0.00	Depth to cemented	0.00
		Droughty	0.00	pan		pan	
		Depth to cemented	0.00			Rock fragments	0.24
		pan				Too sandy	0.78
		Low content of	0.03				
		organic matter					
		Too sandy	0.78				
Dalelake-----	20	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of	0.03				
		organic matter					
		Droughty	0.32				
1555: Goldrose-----	35	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Hard to reclaim	0.00
		Droughty	0.00			(rock fragments)	
		Low content of	0.03			Rock fragments	0.01
		organic matter					
Carsitas, very rarely flooded-----	30	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.02
		Droughty	0.00			Hard to reclaim	0.97
		Low content of	0.03			(rock fragments)	
		organic matter					
Chemwash, rarely flooded-----	25	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of	0.03			(rock fragments)	
		organic matter					
2003: Emptygun-----	100	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Rock fragments	0.00
		Droughty	0.00			Slope	0.00
		Low content of	0.02			Too sandy	0.00
		organic matter				Hard to reclaim	0.08
						(rock fragments)	
2060: Joetree, very rarely flooded-----	35	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of	0.03				
		organic matter					

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2060: Dalelake-----	30	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.32	Good		Poor Too sandy	 0.00
Pintobasin, fine sandy loam-----	25	Fair Too sandy Low content of organic matter Droughty	 0.01 0.03 0.61	Good		Fair Too sandy	 0.01
2065: Dalelake-----	30	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.32	Good		Poor Too sandy	 0.00
Aquapeak-----	25	Poor Droughty Depth to cemented pan Too alkaline Low content of organic matter Carbonate content	 0.00 0.00 0.00 0.03 0.99	Poor Depth to cemented pan	0.00	Poor Depth to cemented pan Rock fragments	0.00 0.82
Coxpin-----	25	Poor Wind erosion Droughty Depth to cemented pan Low content of organic matter Too sandy	 0.00 0.00 0.00 0.03 0.78	Poor Depth to cemented pan	0.00	Poor Depth to cemented pan Rock fragments Too sandy	0.00 0.24 0.78
2067: Aquapeak, overblown-	30	Poor Droughty Depth to cemented pan Too alkaline Low content of organic matter Water erosion	 0.00 0.00 0.00 0.03 0.90	Poor Depth to cemented pan	0.00	Poor Depth to cemented pan	0.00
Buzzardsprings-----	25	Poor Too sandy Wind erosion Too alkaline Low content of organic matter Droughty	 0.00 0.00 0.00 0.03 0.05	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00 0.26

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2067: Dalelake, thick sandy surface-----	20	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.12 0.32	Good		Poor Too sandy	 0.00
Buzzardsprings, steep-----	15	Poor Too sandy Wind erosion Too alkaline Low content of organic matter Droughty	 0.00 0.00 0.00 0.03 0.05	Good		Poor Slope Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00 0.00 0.26
2068: Aquapeak-----	45	Poor Wind erosion Droughty Depth to cemented pan Too alkaline Low content of organic matter	 0.00 0.00 0.00 0.00 0.03	Poor Depth to cemented pan	0.00	Poor Depth to cemented pan Rock fragments	 0.00 0.82
Carpetflat, nongravelly surface	35	Poor Wind erosion Droughty Depth to cemented pan Low content of organic matter Too sandy	 0.00 0.00 0.00 0.03 0.96	Poor Depth to cemented pan	0.00	Poor Rock fragments Depth to cemented pan Too sandy	 0.00 0.00 0.96
Pintobasin-----	15	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.08	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.02 0.97
2070: Missionsweet-----	60	Poor Droughty Depth to cemented pan Low content of organic matter	 0.00 0.00 0.03	Poor Depth to cemented pan	0.00	Poor Rock fragments Depth to cemented pan Slope	 0.00 0.00 0.16
Carpetflat-----	25	Poor Droughty Depth to cemented pan Low content of organic matter Too sandy Water erosion	 0.00 0.00 0.03 0.96 0.99	Poor Depth to cemented pan	0.00	Poor Rock fragments Depth to cemented pan Too sandy	 0.00 0.00 0.96

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2075: Oldale-----	50	Fair Droughty Low content of organic matter Too sandy Too acid	 0.01 0.03  0.08 0.92	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.08 0.16 
Missionsweet-----	30	Poor Droughty Depth to cemented pan Low content of organic matter	 0.00 0.00  0.03	Poor Depth to cemented pan	0.00	Poor Rock fragments Depth to cemented pan Slope	 0.00 0.00  0.16
2076: Oldale-----	40	Poor Droughty Low content of organic matter Too acid	 0.00 0.03  0.92	Good		Poor Rock fragments Hard to reclaim (rock fragments)	 0.00 0.16 
Carrizo-----	30	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.12	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00 
2077: Oldale-----	50	Poor Droughty Low content of organic matter Too sandy Too acid	 0.00 0.03  0.08 0.92	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.08 0.16 
Carrizo-----	25	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00 
Carrizo, very rarely flooded-----	15	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.12	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00 
2085: Rainbowsend-----	45	Poor Droughty Depth to cemented pan Too alkaline Low content of organic matter Stone content	 0.00 0.00  0.00 0.12 0.57	Poor Depth to cemented pan Slope Stones Cobble content	0.00  0.00 0.57 0.92	Poor Rock fragments Depth to cemented pan Slope Too sandy	 0.00 0.00  0.00 0.78

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2085: Goldenbell-----	35	Poor Droughty Depth to cemented pan Low content of organic matter	 0.00 0.00  0.03	Poor Depth to cemented pan	 0.00	Poor Rock fragments Depth to cemented pan	 0.00 0.00
2090: Deprave-----	35	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.03	Poor Depth to cemented pan	 0.00	Poor Rock fragments Too sandy	 0.00 0.00
Rockhound-----	25	Poor Low content of organic matter Droughty	 0.00 0.40	Good		Poor Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00
Rizzo-----	20	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.00	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
2091: Deprave-----	60	Poor Too sandy Droughty Low content of organic matter Depth to cemented pan	 0.00 0.00 0.03 0.08	Poor Depth to cemented pan	 0.00	Poor Rock fragments Too sandy Depth to cemented pan	 0.00 0.00 0.08
Roostertail-----	15	Poor Low content of organic matter Droughty Carbonate content	 0.00 0.02 0.08	Fair Depth to cemented pan	 0.95	Poor Rock fragments Hard to reclaim (rock fragments)	 0.00 0.32
2100: Perurose-----	50	Poor Too sandy Droughty Too alkaline Low content of organic matter Depth to cemented pan	 0.00 0.00 0.00 0.03 0.54	Poor Depth to cemented pan	 0.00	Poor Too sandy Depth to cemented pan Rock fragments	 0.00 0.54 0.99
Coxpin-----	25	Poor Droughty Depth to cemented pan Too alkaline Low content of organic matter Too sandy	 0.00 0.00  0.00 0.03 0.22	Poor Depth to cemented pan	 0.00	Poor Depth to cemented pan Too sandy	 0.00 0.22



# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2100: Pintobasin, gravelly surface---	15	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.03	Good		Poor Too sandy Rock fragments	 0.00 0.18
2101: Perurose, rarely flooded-----	60	Poor Too sandy Wind erosion Droughty Low content of organic matter Depth to cemented pan	 0.00 0.00 0.00 0.03 0.36	Poor Depth to cemented pan	0.00	Poor Too sandy Depth to cemented pan Rock fragments	 0.00 0.36 0.99
Pintobasin, rarely flooded-----	35	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.08	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.02 0.97
2110: Descent-----	80	Poor Too sandy Droughty Low content of organic matter Cobble content	 0.00 0.00 0.03 0.95	Poor Slope Cobble content	0.00 0.21	Poor Hard to reclaim (rock fragments) Rock fragments Too sandy Slope	 0.00 0.00 0.00 0.00
Descent, stable-----	15	Poor Too sandy Droughty Low content of organic matter Cobble content	 0.00 0.00 0.03 0.95	Fair Cobble content	0.23	Poor Hard to reclaim (rock fragments) Rock fragments Too sandy	 0.00 0.00 0.00
2111: Descent, warm-----	45	Poor Too sandy Droughty Low content of organic matter Cobble content	 0.00 0.00 0.03 0.95	Poor Slope Cobble content	0.00 0.21	Poor Hard to reclaim (rock fragments) Rock fragments Slope Too sandy	 0.00 0.00 0.00 0.00
Rubylee, very rarely flooded-----	40	Fair Low content of organic matter Droughty Too sandy	 0.03 0.14 0.44	Good		Poor Rock fragments Slope Too sandy Hard to reclaim (rock fragments)	 0.00 0.37 0.44 0.61

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2120: Rizzo, rarely flooded-----	35	Poor Too sandy Wind erosion Droughty Low content of organic matter Water erosion	 0.00 0.00 0.00 0.00 0.99	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
Deprave-----	35	Poor Too sandy Droughty Low content of organic matter Depth to cemented pan	 0.00 0.00 0.03 0.77	Poor Depth to cemented pan	0.00	Poor Rock fragments Too sandy Depth to cemented pan	 0.00 0.00 0.77
Rizzo, frequently flooded-----	20	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.00	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
2121: Rizzo, rubbly-----	90	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.00	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
2130: Goldenbell-----	55	Poor Droughty Depth to cemented pan Low content of organic matter Water erosion	 0.00 0.00 0.03 0.68	Poor Depth to cemented pan	0.00	Poor Rock fragments Depth to cemented pan	 0.00 0.00
Descent-----	40	Poor Too sandy Wind erosion Droughty Low content of organic matter Cobble content	 0.00 0.00 0.00 0.03 0.96	Fair Cobble content	0.27	Poor Hard to reclaim (rock fragments) Rock fragments Too sandy Slope	 0.00 0.00 0.00 0.37
2140: Rockhound, cobbly---	85	Fair Low content of organic matter Droughty Water erosion	 0.03 0.03 0.99	Good		Poor Hard to reclaim (rock fragments) Rock fragments	 0.00 0.00

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2402: Rizzo-----	70	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.00			(rock fragments)	
Rizzo, frequently flooded-----	20	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.00			Hard to reclaim	0.00
						(rock fragments)	
2403: Rizzo-----	80	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.00			Hard to reclaim	0.00
						(rock fragments)	
Rizzo, occasionally flooded-----	15	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.00			(rock fragments)	
2404: Rizzo, occasionally flooded-----	60	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.00			(rock fragments)	
Rizzo, very rarely flooded-----	35	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.00			(rock fragments)	
		Water erosion	0.99				
2405: Carrizo, rarely flooded-----	65	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.03			(rock fragments)	

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2405: Carrizo, occasionally flooded-----	25	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
2406: Pintobasin, frequently flooded-	50	Poor Too sandy Wind erosion Low content of organic matter Droughty Too acid	 0.00 0.00 0.03 0.04 0.97	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.01 0.95
Carrizo, occasionally flooded-----	40	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
2407: Pintobasin, rarely flooded-----	45	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.08	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.02 0.97
Carrizo, occasionally flooded-----	30	Poor Too sandy Droughty Low content of organic matter	 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
Carrizo, frequently flooded-----	20	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00
2408: Rizzo, frequently flooded-----	55	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.00	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.00

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material	Potential source of roadfill	Potential source of topsoil
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
2408: Rizzo, very rarely flooded-----	35	Poor Too sandy Wind erosion Droughty Low content of organic matter	Good	Poor Rock fragments Too sandy Hard to reclaim (rock fragments)
2409: Rizzo, frequently flooded-----	35	Poor Too sandy Wind erosion Droughty Low content of organic matter	Good	Poor Rock fragments Too sandy Hard to reclaim (rock fragments)
Chemwash, frequently flooded-	30	Poor Too sandy Wind erosion Droughty Low content of organic matter	Good	Poor Rock fragments Too sandy Hard to reclaim (rock fragments)
Carsitas, occasionally flooded, braided---	25	Poor Too sandy Wind erosion Droughty Low content of organic matter	Good	Poor Too sandy Rock fragments Hard to reclaim (rock fragments)
2420: Carsitas, frequently flooded-	45	Poor Too sandy Wind erosion Droughty Low content of organic matter	Good	Poor Too sandy Rock fragments Hard to reclaim (rock fragments)
Carsitas, occasionally flooded-----	40	Poor Too sandy Wind erosion Droughty Low content of organic matter	Good	Poor Too sandy Rock fragments Hard to reclaim (rock fragments)
Carsitas, rarely flooded-----	15	Poor Too sandy Droughty Low content of organic matter	Good	Poor Too sandy Rock fragments Hard to reclaim (rock fragments)

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2421:							
Carsitas, very rarely flooded-----	55	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.02
		Droughty	0.00			Hard to reclaim	0.97
		Low content of organic matter	0.03			(rock fragments)	
Carsitas, rarely flooded-----	25	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Droughty	0.00			Rock fragments	0.02
		Low content of organic matter	0.03			Hard to reclaim	0.97
						(rock fragments)	
2431:							
Chemwash, frequently flooded, braided---	60	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.08			(rock fragments)	
Chemwash, frequently flooded-	25	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.08			(rock fragments)	
2440:							
Rizzo-----	35	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.00			(rock fragments)	
						Slope	0.84
Rizzo, occasionally flooded-----	30	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.00			Hard to reclaim	0.00
						(rock fragments)	
Rizzo, extremely stony-----	15	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.00			Hard to reclaim	0.00
						(rock fragments)	
						Slope	0.37

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2715:							
Dalelake-----	35	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of organic matter	0.03				
		Droughty	0.32				
Sheephole-----	30	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.82
		Low content of organic matter	0.03				
		Droughty	0.06				
Pintobasin-----	25	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.02
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.97
		Droughty	0.08				
2716:							
Dalelake, steep-----	75	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of organic matter	0.03				
		Droughty	0.32				
Dalelake-----	20	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of organic matter	0.03				
		Droughty	0.32				
2717:							
Dalelake-----	40	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.84
		Low content of organic matter	0.03				
		Droughty	0.32				
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Buzzardsprings, fine sand-----	20	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.00
		Too alkaline	0.00			Hard to reclaim (rock fragments)	0.26
		Low content of organic matter	0.03				
		Droughty	0.09				



# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2718:							
Dalelake-----	55	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of organic matter	0.03				
		Droughty	0.32				
Sheephole, gravelly surface-----	45	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of organic matter	0.03				
		Droughty	0.06				
2820:							
Rock outcrop-----	60	Not rated		Not rated		Not rated	
Impedimenta-----	25	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Wind erosion	0.00	Slope	0.98	Too sandy	0.00
		Droughty	0.00			Slope	0.00
		Depth to bedrock	0.00			Rock fragments	0.01
		Low content of organic matter	0.03				
2825:							
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Supplymine-----	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Low content of organic matter	0.03	Slope	0.00	Slope	0.00
		Stone content	0.54	Stones	0.54	Depth to bedrock	0.79
		Depth to bedrock	0.79	Cobble content	0.90		
		Carbonate content	0.99				
Bolero, dry-----	15	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Droughty	0.00	Slope	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Stones	0.99	Slope	0.00
		Low content of organic matter	0.12	Cobble content	0.99	Too sandy	0.00
		Stone content	0.99				
Ironage-----	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.08	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12			Depth to bedrock	0.08
		Too sandy	0.78			Too sandy	0.78
		Carbonate content	0.95				

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2830: Rock outcrop-----	80	Not rated		Not rated		Not rated	
Blackeagle, cool----	10	Poor		Poor		Poor	
		Stone content	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Droughty	0.00	Slope	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Stones	0.00	Slope	0.00
		Low content of organic matter	0.12			Too sandy	0.78
		Too sandy	0.78				
2835: Rock outcrop-----	40	Not rated		Not rated		Not rated	
Blackeagle-----	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
2840: Rock outcrop-----	65	Not rated		Not rated		Not rated	
Jadestorm-----	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
		Too sandy	0.32			Too sandy	0.32
3110: Coppermine, cool----	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
Stranger-----	30	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00			Slope	0.04
		Low content of organic matter	0.00				
		Depth to bedrock	0.00				
3120: Aguilareal-----	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.05			Rock fragments	0.00
		Too sandy	0.96			Too sandy	0.96
Blackeagle-----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03			Slope	0.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3213: Dalvord-----	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.02	Depth to bedrock	0.00
		Low content of organic matter	0.02			Slope	0.00
		Water erosion	0.90				
Aguilareal-----	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.05			Rock fragments	0.00
		Too sandy	0.96			Too sandy	0.96
Rock outcrop-----	25	Not rated		Not rated		Not rated	
3242: Langwell-----	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.02	Rock fragments	0.00
		Low content of organic matter	0.02			Slope	0.00
		Too sandy	0.44			Too sandy	0.44
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Helendale, cool-----	20	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.96
		Low content of organic matter	0.03				
		Too sandy	0.96				
3285: Pinecity-----	30	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00	Slope	0.00	Slope	0.00
		Depth to bedrock	0.00			Too sandy	0.22
		Low content of organic matter	0.05			Rock fragments	0.24
		Too sandy	0.22				
Contactmine-----	20	Fair		Poor		Poor	
		Droughty	0.01	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.03	Slope	0.00	Depth to bedrock	0.23
		Depth to bedrock	0.23			Rock fragments	0.78
Desertqueen-----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.32	Slope	0.00
		Low content of organic matter	0.03			Rock fragments	0.18
Rock outcrop-----	15	Not rated		Not rated		Not rated	

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material	Potential source of roadfill	Potential source of topsoil
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
3286: Pinecity, gravelly loamy sand-----	85	Poor Wind erosion 0.00 Droughty 0.00 Depth to bedrock 0.00 Low content of organic matter 0.05 Too sandy 0.32	Poor Depth to bedrock 0.00 Slope 0.00	Poor Depth to bedrock 0.00 Slope 0.00 Rock fragments 0.24 Too sandy 0.32
3291: Smithcanyon-----	40	Poor Wind erosion 0.00 Droughty 0.00 Depth to bedrock 0.00 Too sandy 0.22 Low content of organic matter 0.50	Poor Depth to bedrock 0.00 Slope 0.82	Poor Depth to bedrock 0.00 Slope 0.00 Rock fragments 0.12 Too sandy 0.22
Stubbespring-----	25	Poor Wind erosion 0.00 Droughty 0.00 Depth to bedrock 0.00 Low content of organic matter 0.12	Poor Depth to bedrock 0.00 Slope 0.00	Poor Depth to bedrock 0.00 Slope 0.00 Rock fragments 0.24
Rock outcrop-----	20	Not rated	Not rated	Not rated
3292: Smithcanyon-----	35	Poor Too sandy 0.00 Wind erosion 0.00 Droughty 0.00 Depth to bedrock 0.00 Low content of organic matter 0.12	Poor Depth to bedrock 0.00 Slope 0.92	Poor Depth to bedrock 0.00 Slope 0.00 Too sandy 0.00 Rock fragments 0.00
Pinecity-----	25	Poor Too sandy 0.00 Wind erosion 0.00 Droughty 0.00 Depth to bedrock 0.00 Low content of organic matter 0.12	Poor Depth to bedrock 0.00 Slope 0.00	Poor Depth to bedrock 0.00 Slope 0.00 Too sandy 0.00 Rock fragments 0.00
Rock outcrop-----	25	Not rated	Not rated	Not rated
3293: Smithcanyon-----	50	Poor Too sandy 0.00 Wind erosion 0.00 Droughty 0.00 Depth to bedrock 0.00 Low content of organic matter 0.12	Poor Depth to bedrock 0.00 Slope 0.00	Poor Depth to bedrock 0.00 Slope 0.00 Too sandy 0.00 Rock fragments 0.00

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3293: Pinecity-----	25	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Wind erosion	0.00	Slope	0.00	Slope	0.00
		Droughty	0.00			Too sandy	0.00
		Depth to bedrock	0.00			Rock fragments	0.00
		Low content of organic matter	0.12				
3294: Smithcanyon, dry----	80	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Wind erosion	0.00	Slope	0.00	Slope	0.00
		Droughty	0.00			Too sandy	0.00
		Depth to bedrock	0.00			Rock fragments	0.00
		Low content of organic matter	0.88				
3295: Desertqueen, dry----	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.03			Rock fragments	0.18
Hexie-----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.03	Slope	0.00	Too sandy	0.78
		Too sandy	0.78			Rock fragments	0.98
Rock outcrop-----	20	Not rated		Not rated		Not rated	
3296: Desertqueen-----	45	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00	Slope	0.82	Slope	0.00
		Depth to bedrock	0.00	Stones	0.92	Rock fragments	0.53
		Low content of organic matter	0.03			Too sandy	0.78
		Too sandy	0.78				
Pinecity-----	35	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Wind erosion	0.00	Slope	0.92	Slope	0.00
		Droughty	0.00			Too sandy	0.00
		Depth to bedrock	0.00			Rock fragments	0.89
		Low content of organic matter	0.05				
3297: Desertqueen, warm---	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.68	Slope	0.00
		Low content of organic matter	0.03			Rock fragments	0.96
Contactmine, dry----	20	Fair		Fair		Poor	
		Low content of organic matter	0.03	Depth to bedrock	0.29	Slope	0.00
		Droughty	0.85	Slope	0.82		
		Water erosion	0.99				

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3297: Seanna, dry-----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12			Rock fragments	0.18
3325: Ironped, warm-----	30	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Wind erosion	0.00	Slope	0.00	Slope	0.00
		Droughty	0.00			Too sandy	0.00
		Depth to bedrock	0.00			Rock fragments	0.00
		Low content of organic matter	0.05				
Rock outcrop-----	20	Not rated		Not rated		Not rated	
Hexie-----	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.03	Slope	0.00	Rock fragments	0.01
		Too sandy	0.78			Too sandy	0.78
		Depth to bedrock	0.92			Depth to bedrock	0.92
Ironped-----	15	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Wind erosion	0.00	Slope	0.00	Slope	0.00
		Droughty	0.00			Too sandy	0.00
		Depth to bedrock	0.00			Rock fragments	0.00
		Low content of organic matter	0.05				
3335: Xeric Torriorthents-	40	Poor		Poor		Poor	
		Wind erosion	0.00	Slope	0.00	Rock fragments	0.00
		Droughty	0.00	Depth to bedrock	0.54	Slope	0.00
		Too sandy	0.08			Too sandy	0.08
		Low content of organic matter	0.12			Hard to reclaim (rock fragments)	0.26
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Xeric Torriorthents, warm	25	Poor		Poor		Poor	
		Wind erosion	0.00	Slope	0.00	Rock fragments	0.00
		Droughty	0.00	Depth to bedrock	0.54	Slope	0.00
		Too sandy	0.08			Too sandy	0.08
		Low content of organic matter	0.12			Hard to reclaim (rock fragments)	0.26
3336: Xeric Torriorthents-	45	Poor		Poor		Poor	
		Wind erosion	0.00	Slope	0.00	Rock fragments	0.00
		Droughty	0.00	Depth to bedrock	0.54	Slope	0.00
		Too sandy	0.08			Too sandy	0.08
		Low content of organic matter	0.12			Hard to reclaim (rock fragments)	0.26

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3336: Bigbernie-----	25	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Slope	0.00
		Wind erosion	0.00	Slope	0.00	Too sandy	0.00
		Droughty	0.00	Stones	0.54	Rock fragments	0.00
		Low content of organic matter	0.03			Depth to bedrock	0.08
		Depth to bedrock	0.08				
3340: Seanna-----	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.03			Rock fragments	0.00
Grubstake, moist----	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.03			Rock fragments	0.82
Pinecity-----	15	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00	Slope	0.00	Slope	0.00
		Depth to bedrock	0.00			Too sandy	0.08
		Too sandy	0.08				
		Low content of organic matter	0.12				
3345: Bigcanyon-----	55	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Slope	0.00
		Wind erosion	0.00	Slope	0.00	Too sandy	0.00
		Droughty	0.00			Depth to bedrock	0.00
		Depth to bedrock	0.00				
		Low content of organic matter	0.03				
Bigcanyon, cool-----	20	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Slope	0.00
		Wind erosion	0.00	Slope	0.00	Too sandy	0.00
		Droughty	0.00			Depth to bedrock	0.07
		Low content of organic matter	0.03			Rock fragments	0.88
		Depth to bedrock	0.07				
3440: Pacific Mesa, steep-	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.03	Stones	0.60	Slope	0.00
		Stone content	0.60	Cobble content	0.70		
Pacific Mesa-----	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Stones	0.41	Depth to bedrock	0.00
		Low content of organic matter	0.03	Cobble content	0.76		
		Water erosion	0.06				
		Stone content	0.41				



# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3509: Cajon, very rarely flooded-----	60	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.07	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00 0.05
Friedliver-----	20	Fair Low content of organic matter	 0.03	Good		Poor Rock fragments Hard to reclaim (rock fragments)	 0.00 0.99
3525: Cajon-----	70	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.07	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.01 0.95
Friedliver-----	15	Poor Wind erosion Low content of organic matter Droughty	 0.00 0.03 0.33	Good		Fair Rock fragments	 0.82
3526: Cajon-----	40	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.39	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.24 0.26
Hypoint-----	35	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.01
Arizo, occasionally flooded-----	15	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.03	Fair Cobble content	0.99	Poor Hard to reclaim (rock fragments) Rock fragments Too sandy	 0.00  0.00 0.00
3611: Burntshack, sand surface-----	50	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.59	Good		Poor Too sandy Rock fragments	 0.00 0.68

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3611: Burntshack-----	35	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.68
		Low content of organic matter	0.03				
		Droughty	0.60				
3612: Burntshack-----	75	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.88
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.92
		Droughty	0.83				
Burntshack, occasionally flooded-----	20	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.88
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.92
		Droughty	0.82				
3676: Morongo, loamy sand, very rarely flooded-----	80	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.30
		Droughty	0.00				
		Low content of organic matter	0.05				
		Too sandy	0.30				
3677: Morongo-----	80	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.99
		Droughty	0.08				
		Low content of organic matter	0.12				
3679: Morongo, cool-----	55	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.88
		Droughty	0.00				
		Low content of organic matter	0.05				
Jumborox-----	20	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.08
		Low content of organic matter	0.03				
		Too sandy	0.08				
		Droughty	0.95				

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3680: Morongo-----	85	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.03 0.03	Good		Poor Too sandy Rock fragments	 0.00 0.99
3681: Morongo, very rarely flooded-----	45	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.02 0.03	Good		Poor Too sandy Rock fragments	 0.00 0.99
Jumborox, dry-----	35	Poor Wind erosion Low content of organic matter Too sandy Droughty	 0.00 0.03 0.08 0.95	Good		Fair Too sandy	 0.08
3682: Morongo, cool-----	50	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.05	Good		Poor Too sandy Rock fragments	 0.00 0.88
Jumborox-----	15	Poor Wind erosion Low content of organic matter Droughty Too sandy	 0.00 0.03 0.42 0.44	Good		Fair Too sandy	 0.44
Urban land-----	15	Not rated		Not rated		Not rated	
3683: Morongo-----	55	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.03	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00 0.84
Bluecut, very rarely flooded-----	30	Fair Low content of organic matter Droughty Too sandy	 0.03 0.81 0.96	Good		Poor Rock fragments Hard to reclaim (rock fragments) Too sandy	 0.00 0.68 0.96

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3684: Morongo, warm-----	85	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.05 0.24	Good		Poor Too sandy Rock fragments	 0.00 0.08
3685: Morongo, cool-----	65	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.05	Good		Poor Too sandy Slope Rock fragments	 0.00 0.37 0.88
Desertqueen, undulating-----	15	Poor Wind erosion Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.00 0.03	Poor Depth to bedrock Slope	 0.00 0.00	Poor Depth to bedrock Slope Rock fragments	 0.00 0.00 0.24
3690: Nasagold-----	85	Poor Wind erosion Low content of organic matter Too sandy	 0.00 0.03 0.86	Good		Fair Rock fragments Too sandy	 0.18 0.86
3695: Gocougs-----	80	Poor Wind erosion Low content of organic matter Droughty Depth to cemented pan	 0.00 0.03 0.33 0.80	Poor Depth to cemented pan	 0.00	Fair Rock fragments Depth to cemented pan	 0.12 0.80
4031: Crosgrain-----	50	Poor Droughty Depth to cemented pan Low content of organic matter	 0.00 0.00 0.12	Poor Depth to cemented pan Slope	 0.00 0.98	Poor Rock fragments Depth to cemented pan Slope	 0.00 0.00 0.00
Crackerjack-----	30	Poor Droughty Depth to cemented pan Low content of organic matter	 0.00 0.00 0.12	Poor Depth to cemented pan Stones Slope	 0.00 0.09 0.92	Poor Depth to cemented pan Rock fragments Slope	 0.00 0.00 0.00
Pinkcan, dry-----	15	Poor Low content of organic matter Droughty	 0.00 0.98	Fair Depth to cemented pan	 0.32	Fair Rock fragments	 0.82

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4041: Silvermine-----	40	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to cemented	0.00	Depth to cemented	0.00
		Droughty	0.00	pan		pan	
		Depth to cemented	0.00			Too sandy	0.22
		pan				Rock fragments	0.32
		Too alkaline	0.00				
		Low content of	0.03				
		organic matter					
Helendale-----	30	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Low content of	0.03			Rock fragments	0.00
		organic matter				Hard to reclaim	0.74
		Droughty	0.71			(rock fragments)	
Burntshack, very rarely flooded-----	20	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of	0.03				
		organic matter					
		Droughty	0.70				
4064: Gravesumit-----	55	Poor		Good		Fair	
		Wind erosion	0.00			Hard to reclaim	0.39
		Low content of	0.03			(rock fragments)	
		organic matter				Too sandy	0.78
		Droughty	0.77				
		Too sandy	0.78				
Helendale, sandy surface-----	35	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.96
		Low content of	0.03				
		organic matter					
		Too sandy	0.96				
4071: Helendale-----	65	Fair		Good		Fair	
		Low content of	0.03			Too sandy	0.96
		organic matter					
		Too sandy	0.96				
Desertqueen, very rarely flooded-----	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.37
		Low content of	0.03			Rock fragments	0.82
		organic matter					
		Too acid	0.99				
4091: Littlefargo-----	85	Poor		Poor		Fair	
		Wind erosion	0.00	Depth to bedrock	0.00	Slope	0.84
		Low content of	0.03			Depth to bedrock	0.84
		organic matter				Too sandy	0.96
		Droughty	0.12				
		Depth to bedrock	0.84				
		Too sandy	0.96				

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4245: Bluecut-----	40	Poor		Good		Poor	
		Wind erosion	0.00			Too sandy	0.00
		Too sandy	0.00			Rock fragments	0.00
		Low content of organic matter	0.03				
Morongo, very rarely flooded----	25	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.99
		Droughty	0.02				
		Low content of organic matter	0.03				
Yander, very rarely flooded-----	15	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Droughty	0.00			Too sandy	0.32
		Low content of organic matter	0.03				
		Too sandy	0.32				
4260: Minhoyt-----	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00			Rock fragments	0.00
		Low content of organic matter	0.03			Too sandy	0.22
		Too sandy	0.22				
Corbilt, rarely flooded-----	40	Poor		Fair		Good	
		Wind erosion	0.00	Depth to cemented pan	0.68		
		Low content of organic matter	0.03				
		Droughty	0.82				
4265: Werewolf, warm----	80	Poor		Good		Poor	
		Droughty	0.00			Rock fragments	0.00
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.01
4270: Yuccabutte-----	95	Poor		Poor		Poor	
		Stone content	0.00	Stones	0.00	Rock fragments	0.00
		Droughty	0.01	Slope	0.02	Slope	0.00
		Low content of organic matter	0.03				
4271: Yuccabutte, warm----	60	Fair		Good		Poor	
		Low content of organic matter	0.03			Rock fragments	0.00
		Droughty	0.38				
		Water erosion	0.90				

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4271: Arizo, rarely flooded-----	30	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.03	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.00 0.01
4275: Pinkcan-----	35	Poor Low content of organic matter Water erosion Droughty	 0.00 0.90 0.98	Fair Depth to cemented pan	0.32	Fair Rock fragments	0.82
Werewolf-----	25	Poor Wind erosion Low content of organic matter Droughty	 0.00 0.03 0.47	Good		Poor Rock fragments Hard to reclaim (rock fragments)	 0.00 0.74
Gocougs, warm-----	15	Fair Low content of organic matter Droughty Depth to cemented pan Water erosion	 0.03 0.69 0.87 0.99	Poor Depth to cemented pan	0.00	Poor Rock fragments Depth to cemented pan	 0.00 0.87
4280: Mekkadale-----	55	Poor Droughty Depth to cemented pan Low content of organic matter Water erosion	 0.00 0.00 0.03 0.90	Poor Depth to cemented pan Slope	0.00 0.98	Poor Depth to cemented pan Slope Rock fragments	 0.00 0.00 0.98
Edalph, warm-----	25	Fair Low content of organic matter Droughty	 0.03 0.22	Poor Slope	0.00	Poor Slope Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00 0.74
4285: Typic Argidurids----	35	Poor Droughty Low content of organic matter Depth to cemented pan Water erosion	 0.00 0.03 0.07 0.90	Poor Depth to cemented pan Slope	0.00 0.98	Poor Rock fragments Slope Depth to cemented pan	 0.00 0.00 0.07
Coppermine-----	30	Poor Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.03	Poor Depth to bedrock Slope	0.00 0.00	Poor Rock fragments Depth to bedrock Slope	 0.00 0.00 0.00



# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4285: Minhoyt, warm-----	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented	0.00	Depth to cemented	0.00
		pan		pan		pan	
		Depth to cemented	0.00			Slope	0.37
		Low content of	0.03			Rock fragments	0.92
		organic matter					
		Water erosion	0.68				
4403: Arizo, rarely flooded, channeled-	50	Poor		Fair		Poor	
		Too sandy	0.00	Cobble content	0.72	Hard to reclaim	0.00
		Wind erosion	0.00			(rock fragments)	
		Droughty	0.00			Rock fragments	0.00
		Low content of	0.03			Too sandy	0.00
		organic matter					
Arizo, rarely flooded-----	25	Poor		Fair		Poor	
		Too sandy	0.00	Cobble content	0.72	Hard to reclaim	0.00
		Wind erosion	0.00			(rock fragments)	
		Droughty	0.00			Rock fragments	0.00
		Low content of	0.03			Too sandy	0.00
		organic matter					
Arizo-----	20	Poor		Fair		Poor	
		Too sandy	0.00	Cobble content	0.62	Hard to reclaim	0.00
		Droughty	0.00			(rock fragments)	
		Low content of	0.03			Rock fragments	0.00
		organic matter				Too sandy	0.00
4440: Dragonwash, occasionally flooded-----	55	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Low content of	0.03			Hard to reclaim	0.00
		organic matter				(rock fragments)	
		Droughty	0.32				
Dragonwash, frequently flooded-	35	Poor		Good		Poor	
		Too sandy	0.00			Rock fragments	0.00
		Wind erosion	0.00			Too sandy	0.00
		Low content of	0.03			Hard to reclaim	0.00
		organic matter				(rock fragments)	
		Droughty	0.32				
4450: Morongo, occasionally flooded-----	75	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Droughty	0.00				
		Low content of	0.05				
		organic matter					

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4450: Morongo, frequently flooded-----	15	Poor Too sandy Wind erosion Droughty Low content of organic matter	 0.00 0.00 0.00 0.05	Good		Poor Too sandy Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00 0.68
4605: Pinecity, moist----	80	Poor Too sandy Wind erosion Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.00 0.00 0.05	Poor Depth to bedrock	0.00	Poor Depth to bedrock Too sandy	 0.00 0.00
4606: Pinecity-----	60	Poor Wind erosion Droughty Depth to bedrock Low content of organic matter Too sandy	 0.00 0.00 0.00 0.12 0.14	Poor Depth to bedrock	0.00	Poor Depth to bedrock Slope Too sandy Rock fragments	 0.00 0.00 0.14 0.50
Rock outcrop-----	25	Not rated		Not rated		Not rated	
4607: Pinecity-----	85	Poor Too sandy Wind erosion Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.00 0.00 0.05	Poor Depth to bedrock	0.00	Poor Depth to bedrock Too sandy Rock fragments	 0.00 0.00 0.89
4608: Pinecity-----	60	Poor Too sandy Wind erosion Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.00 0.00 0.05	Poor Depth to bedrock	0.00	Poor Depth to bedrock Too sandy	 0.00 0.00
Rock outcrop-----	30	Not rated		Not rated		Not rated	
4610: Desertqueen-----	35	Poor Droughty Depth to bedrock Low content of organic matter Too acid	 0.00 0.00 0.03 0.99	Poor Depth to bedrock	0.00	Poor Depth to bedrock Rock fragments	 0.00 0.82

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4610: Jumborox, warm-----	25	Poor Wind erosion Low content of organic matter Too sandy Droughty	 0.00 0.03  0.32 0.83	Good		Poor Rock fragments Too sandy	 0.00 0.32
Rock outcrop-----	20	Not rated		Not rated		Not rated	
4615: Desertqueen, cool---	45	Poor Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.03	Poor Depth to bedrock Slope	 0.00 0.08	Poor Depth to bedrock Slope Rock fragments	 0.00 0.00 0.96
Jumborox-----	25	Poor Wind erosion Low content of organic matter Too sandy Droughty	 0.00 0.03  0.08 0.95	Good		Fair Too sandy	 0.08
Rock outcrop-----	15	Not rated		Not rated		Not rated	
4620: Stranger-----	40	Poor Too sandy Wind erosion Droughty Low content of organic matter Depth to bedrock	 0.00 0.00 0.00 0.00 0.00	Poor Depth to bedrock Slope	 0.00 0.00	Poor Depth to bedrock Too sandy Slope	 0.00 0.00 0.00
Rock outcrop-----	35	Not rated		Not rated		Not rated	
Grubstake, moist----	20	Poor Wind erosion Droughty Depth to bedrock Low content of organic matter Too sandy	 0.00 0.00 0.00 0.03  0.78	Poor Depth to bedrock	 0.00	Poor Depth to bedrock Slope Too sandy Rock fragments	 0.00 0.00 0.78 0.82
4625: Grinder-----	50	Poor Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.03	Poor Depth to bedrock	 0.00	Poor Depth to bedrock Rock fragments	 0.00 0.00
Grinder, cool-----	20	Poor Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.03	Poor Depth to bedrock Slope	 0.00 0.98	Poor Depth to bedrock Rock fragments Slope	 0.00 0.00 0.00
Pinkcan, cool-----	15	Poor Low content of organic matter Droughty	 0.00  0.98	Fair Depth to cemented pan	 0.32	Fair Rock fragments	 0.82

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4630: Thunderclap-----	50	Poor Too sandy Wind erosion Low content of organic matter Droughty	 0.00 0.00 0.02 0.16	Good		Poor Too sandy	 0.00
Smithcanyon-----	30	Poor Too sandy Wind erosion Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.00 0.00 0.88	Poor Depth to bedrock	0.00	Poor Depth to bedrock Too sandy Slope	 0.00 0.00 0.84
4804: Rock outcrop-----	45	Not rated		Not rated		Not rated	
Ironped-----	25	Poor Wind erosion Droughty Depth to bedrock Low content of organic matter Too sandy	 0.00 0.00 0.00 0.05 0.32	Poor Depth to bedrock Slope	0.00 0.00	Poor Depth to bedrock Slope Rock fragments Too sandy	 0.00 0.00 0.01 0.32
Pinecity-----	20	Poor Wind erosion Droughty Depth to bedrock Low content of organic matter Too sandy	 0.00 0.00 0.00 0.12 0.14	Poor Depth to bedrock Slope	0.00 0.00	Poor Depth to bedrock Slope Too sandy Rock fragments	 0.00 0.00 0.14 0.50
4805: Rock outcrop-----	50	Not rated		Not rated		Not rated	
Ironped, cool-----	30	Poor Wind erosion Droughty Depth to bedrock Low content of organic matter Too sandy	 0.00 0.00 0.00 0.05 0.32	Poor Depth to bedrock	0.00	Poor Depth to bedrock Slope Rock fragments Too sandy	 0.00 0.00 0.01 0.32
4806: Rock outcrop-----	90	Not rated		Not rated		Not rated	
4811: Rock outcrop-----	85	Not rated		Not rated		Not rated	
Pioneertown-----	10	Poor Too sandy Wind erosion Droughty Depth to bedrock Low content of organic matter	 0.00 0.00 0.00 0.00 0.18	Poor Depth to bedrock Slope	0.00 0.00	Poor Depth to bedrock Slope Too sandy Rock fragments	 0.00 0.00 0.00 0.00

# Soil Survey of Joshua Tree National Park, California

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4825:							
Rock outcrop-----	30	Not rated		Not rated		Not rated	
Grubstake-----	20	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00			Too sandy	0.78
		Depth to bedrock	0.00			Rock fragments	0.82
		Low content of organic matter	0.03				
		Too sandy	0.78				
Cajon, rarely flooded-----	20	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.00
		Low content of organic matter	0.03			Hard to reclaim (rock fragments)	0.05
		Droughty	0.07				
Stranger, warm-----	15	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Wind erosion	0.00			Too sandy	0.00
		Droughty	0.00				
		Low content of organic matter	0.00				
		Depth to bedrock	0.00				
4830:							
Rock outcrop-----	80	Not rated		Not rated		Not rated	
Pinecity, cool-----	10	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00			Slope	0.00
		Depth to bedrock	0.00			Too sandy	0.14
		Low content of organic matter	0.12			Rock fragments	0.50
		Too sandy	0.14				
4900:							
Rock outcrop-----	65	Not rated		Not rated		Not rated	
Aguilareal-----	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.05			Slope	0.00
		Too sandy	0.96			Too sandy	0.96
Lostpalms-----	15	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Wind erosion	0.00	Slope	0.00	Too sandy	0.00
		Droughty	0.00	Cobble content	0.28	Rock fragments	0.00
		Depth to bedrock	0.00			Slope	0.00
		Low content of organic matter	0.03				

Table 18.--Engineering Properties  
(Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
1220: Jadestorm-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>		
	0-2	Gravel	GP	A-1-a	0-17	12-32	8-24	4-20	3-17	1-5	15-23	1-7	
	2-3	Very gravelly loamy sand	GP-GC	A-1-a	0	6-12	35-57	32-55	24-46	5-13	15-23	1-7	
	3-10	Extremely gravelly loam, very gravelly sandy loam	GP-GC	A-2-4	0-2	3-33	22-54	18-52	12-40	4-16	17-26	3-10	
	10-17	Bedrock	---	---	---	---	---	---	---	---	---	---	
Blackeagle, cool	17-26	Bedrock	---	---	---	---	---	---	---	---	---	---	
	0-2	Gravel	GP	A-1-a	1-10	21-30	8-20	4-16	3-13	1-4	15-21	1-5	
	2-3	Very gravelly loamy sand	GP-GC	A-1-b, A-1-a	0	6-12	32-46	29-44	22-36	6-11	15-21	1-5	
	3-11	Very gravelly loamy sand, extremely gravelly loamy sand	GP-GC	A-1-b, A-1-a	0	0-22	24-46	21-44	17-36	5-11	19-20	4-5	
	11-18	Extremely gravelly sandy loam, very gravelly sandy loam	GC-GM	A-2-4, A-2-6, A-1-a, A-1-b	0-11	6-22	22-57	19-55	13-44	6-22	19-28	4-11	
Rock outcrop.	18-30	Bedrock	---	---	---	---	---	---	---	---	---	---	
1225: Blackeagle-----	0-3	Gravel	GP	A-1-a	1-20	24-40	9-22	4-18	3-15	1-7	17-23	3-7	
	3-4	Extremely gravelly sandy loam	GP-GM	A-1-a	0	5-11	24-28	20-24	15-20	7-9	17-23	3-7	
	4-14	Extremely gravelly sandy loam, very gravelly sandy loam	GC	A-2-6, A-1-b, A-2-4	0-11	6-22	22-57	19-55	13-44	6-22	19-28	4-11	
	14-24	Bedrock	---	---	---	---	---	---	---	---	---	---	
Rock outcrop.													
1230: Jadestorm-----	0-3	Gravel	GP	A-1-a	0-17	12-30	8-20	4-17	3-14	1-7	17-23	3-7	
	3-7	Extremely gravelly sandy loam	SP-SM	A-1-a	0-2	0-13	64-73	24-33	18-27	9-14	17-23	3-7	
	7-11	Extremely gravelly loam, very gravelly sandy loam	GP-GC	A-2-4	0-2	3-33	22-54	18-52	12-40	4-16	17-26	3-10	
	11-20	Bedrock	---	---	---	---	---	---	---	---	---	---	
	20-30	Bedrock	---	---	---	---	---	---	---	---	---	---	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>					<u>Pct</u>	<u>Pct</u>					<u>Pct</u>		
1230:														
Jadestorm, cool-	0-2	Gravel		A-1-a	GP	0-17	12-31	8-23	4-19	3-16	1-8	17-23	3-7	
	2-3	Very gravelly sandy loam	SM	A-1-a		0-2	0-14	65-73	32-53	24-43	11-22	17-23	3-7	
	3-10	Extremely gravelly loam, very gravelly sandy loam	GP-GC	A-2-4		0-2	3-33	22-54	18-52	12-40	4-16	17-26	3-10	
	10-17	Bedrock	---	---		---	---	---	---	---	---	---	---	
	17-26	Bedrock	---	---		---	---	---	---	---	---	---	---	
Rock outcrop.														
1240:														
Meccapass-----	0-1	Gravel	GP-GM	A-1-a		1-20	8-51	21-27	8-15	8-15	3-6	17-21	3-6	
	1-2	Gravelly loamy fine sand	SM	A-2-4		0	0	82-89	65-78	62-77	23-30	17-22	3-6	
	2-16	Very gravelly sandy loam, gravelly sandy loam, very gravelly loam	GC-GM	A-1-b		0	0-22	45-93	21-77	17-72	11-51	17-28	3-11	
	16-37	Extremely gravelly sandy loam	GP-GC	A-2-4		0-5	0-21	39-44	10-29	7-23	4-14	17-24	3-8	
	37-59	Bedrock	---	---		---	---	---	---	---	---	---	---	
Bulletproof-----	0-3	Gravel	GW	A-1-a		1-15	6-41	25-48	3-22	2-17	1-5	0-16	NP-2	
	3-6	Gravelly loamy sand	SM	A-2-4		0	0	79-87	58-77	43-62	11-21	0-21	NP-4	
	6-11	Loamy sand, very paragravelly loamy coarse sand	SM	A-1-b		0	0	80-97	59-91	31-51	10-19	15-20	1-4	
	11-59	Bedrock	---	---		---	---	---	---	---	---	---	---	
Rock outcrop.														
1241:														
Meccapass-----	0-1	Gravel	SP	A-1-a, A-2-4		5-20	15-50	52-69	0-16	0-13	0-7	17-23	3-7	
	1-2	Gravelly sandy loam	SC-SM	A-2-4		0	0	82-88	61-77	45-61	22-33	17-24	3-7	
	2-16	Very gravelly sandy loam, gravelly sandy loam, very gravelly loam	GC-GM	A-1-b		0	0-22	45-93	21-77	17-72	11-51	17-28	3-11	
	16-27	Extremely gravelly sandy loam	GP-GC	A-2-4		0-5	0-21	39-44	10-29	7-23	4-14	17-24	3-8	
	27-59	Bedrock	---	---		---	---	---	---	---	---	---	---	



Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
1241: Seanna-----	In						Pct					Pct		
	0-1	Gravelly sandy loam	SC-SM	A-2-4										
	1-12	Gravelly sandy loam	SC-SM	A-2-4	0	0-7	71-98	50-82	38-70	18-38	19-29	19-29	4-12	
	12-59	Bedrock	---	---	0	0	77-92	62-83	48-71	23-39	19-29	19-29	4-12	
					---	---	---	---	---	---	---	---	---	
Contactmine, dry	0-2	Gravelly sandy loam	SC-SM	A-2-4										
	2-6	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SC	A-2-6	0	0-6	85-92	63-76	46-64	21-34	17-29	17-29	3-12	
	6-11	Gravelly sandy clay loam, very gravelly sandy loam, clay loam, sandy clay loam	SC	A-6	0	1-9	65-98	48-96	40-92	24-60	27-40	27-40	11-21	
	11-25	Stony sandy loam, paracobbly clay loam, gravelly loam, cobbly loam, gravelly sandy loam	CL	A-6	0-28	3-22	85-98	55-96	48-92	33-68	28-38	28-38	12-19	
	25-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---	
1242: Meccapass-----	0-1	Gravel	SP	A-1-a	5-20	15-50	52-69	0-16	0-13	0-7	17-21	17-21	3-6	
	1-2	Very gravelly sandy loam	SC-SM	A-2-4	0	0-6	71	50-56	42-49	23-28	17-22	17-22	3-6	
	2-16	Very gravelly sandy loam, gravelly sandy loam, very gravelly loam	GC-GM	A-1-b	0	0-22	45-93	21-77	17-72	11-51	17-28	17-28	3-11	
	16-27	Extremely gravelly sandy loam	GP-GC	A-2-4	0-5	0-21	39-44	10-29	7-23	4-14	17-24	17-24	3-8	
Jadestorm-----	27-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---	
	0-2	Gravel	GW	A-1-a	0-17	12-30	4-20	0-17	0-14	0-7	17-23	17-23	3-7	
	2-3	Gravelly sandy loam	SM	A-1-b	0	0-4	79-85	52-63	39-51	18-26	17-24	17-24	3-7	
	3-8	Extremely gravelly loam, very gravelly sandy loam	GP-GC	A-2-4	0-2	3-33	22-54	18-52	12-40	4-16	17-26	17-26	3-10	
	8-20	Bedrock	---	---	---	---	---	---	---	---	---	---	---	
Rock outcrop.	20-30	Bedrock	---	---	---	---	---	---	---	---	---	---	---	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid	Plas-
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200	limit	ticity index	
1250: Ironlung-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
	0-2	Very gravelly sand	SP, SP-SM	A-1-a, A-1-b	0	0-13	61-85	28-62	21-50	3-10	0-17	NP-2	
	2-6	Very gravelly sand, very gravelly loamy sand, very gravelly coarse sand, very gravelly loamy fine sand	SW, SP	A-1-a, A-1-b	0	0	73-81	29-56	13-26	2-6	0-17	NP-2	
	6-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
Ironlung, cool--	0-1	Very gravelly sand	SP, SP-SM	A-1-a, A-1-b	0	0-13	61-85	28-62	21-49	2-7	0-17	NP-2	
	1-4	Very gravelly sand, very gravelly loamy sand, very gravelly coarse sand, very gravelly loamy fine sand	SW, SW-SM	A-1-a, A-1-b	0	0	75-80	30-54	13-25	2-6	0-17	NP-2	
	4-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
Rock outcrop.													

Table 18.--Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
1255: Goldenhills-----	In				Pct	Pct						Pct		
	0-2	Gravel	GW-GM	A-1-a	6-40	12-27	25-38	3-22	2-17	1-6	0-19	NP-4		
	2-3	Very gravelly sand, extremely stony loamy sand, very gravelly loamy sand, very gravelly loamy fine sand	SP-SM	A-1-a, A-1-b	0-23	2-12	61-72	28-43	21-35	6-12	0-20	NP-4		
	3-10	Very gravelly loamy fine sand, very gravelly loamy sand	SM	A-1-a, A-1-b	0-5	2-11	64-65	36-52	28-43	10-18	0-21	NP-6		
	10-26	Extremely stony loamy fine sand, extremely gravelly sand, extremely stony sand, extremely stony loamy sand, extremely cobbly loamy sand, gravelly loamy sand, gravelly loamy fine sand, extremely gravelly loamy sand	SM	A-1-a, A-1-b	0-31	4-15	38-74	9-62	7-52	2-21	0-21	NP-6		
	26-47	Extremely stony loamy fine sand, extremely gravelly sand, extremely stony sand, extremely stony loamy sand, extremely cobbly loamy sand, gravelly loamy sand, gravelly loamy fine sand, extremely gravelly loamy sand	GW-GM	A-2-4, A-1-a	0-26	4-32	33-70	13-63	9-52	3-19	0-21	NP-6		
	47-57	Bedrock												
	Bulletproof-----	0-2	Cobbles	GW	A-1-a	1-15	6-41	25-48	3-22	2-17	1-5	0-16	NP-2	
		2-3	Gravelly loamy sand	SM	A-2-4, A-1-b	0	0	72-84	55-77	40-60	11-18	0-17	NP-2	
		3-5	Gravelly loamy sand, loamy sand	SM	A-1-b, A-2-4	0	0	80-97	59-91	44-75	13-27	0-21	NP-6	
5-14		Fine sand, gravelly loamy sand, loamy sand	SC-SM	A-1-b, A-2-4	0	0	93-100	65-94	48-78	13-27	0-21	NP-6		
14-59		Bedrock												

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
1255: Fanhill-----	0-5	Cobbles	GP	A-1-a	0-8	18-31	27-35	3-19	3-17	1-7	17-20	3-4	
	5-6	Gravelly sandy loam, fine sandy loam	GP	A-1-a	0-8	18-31	27-35	3-19	3-17	1-7	17-20	3-4	
	6-15	Gravelly sandy loam	SC-SM	A-1-b	0	0	64-84	48-76	34-59	15-29	17-23	3-7	
	15-18	Gravelly loamy coarse sand	SP-SM	A-1-b	0	0	73-75	60-63	32-38	12-16	17-23	3-7	
	18-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
Whiterobe-----	0-1	Gravel	GW	A-1-a	0-5	20-21	32	8-17	6-13	2-4	0-15	NP-1	
	1-2	Extremely gravelly loamy sand, very gravelly loamy sand	GW, SP-SM	A-1-b, A-1-a	0	0-11	42-70	16-54	12-42	3-13	0-16	NP-1	
	2-12	Very gravelly loamy sand fine sand, very gravelly sand, very gravelly loamy sand	SM	A-1-a, A-1-b	0	0-2	46-68	30-55	22-43	7-16	0-17	NP-3	
	12-26	Gravelly sand, loamy fine sand, paragravelly sand, gravelly loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0	87-95	54-92	41-75	6-16	0-18	NP-3	
	26-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
1260: Whiterobe-----	0-1	Very gravelly loamy sand	SP-SM	A-1-b	0	0-6	66-70	40-54	30-42	9-13	0-16	NP-1	
	1-11	Very gravelly loamy fine sand, gravelly sand, very gravelly loamy sand, very gravelly sand	SM	A-1-a, A-1-b	0	0-2	60-86	32-78	24-62	8-23	0-18	NP-3	
	11-24	Loamy fine sand, paragravelly sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-2-4	0	0	87-95	54-92	41-75	6-16	0-18	NP-3	
	24-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
	0-1	Gravelly loamy sand	SM	A-1-b	0-2	0-13	81-94	57-78	43-62	13-20	0-17	NP-2	
Bigbernie-----	1-4	Extremely gravelly sand, very gravelly loamy coarse sand, very gravelly fine sand, very gravelly loamy sand, very gravelly sand	SP-SM, SM	A-2-4, A-1-a, A-1-b	0-17	0-19	50-80	25-64	19-51	7-19	0-17	NP-2	
	4-24	Extremely gravelly coarse sand, very gravelly sand	SP-SM	A-2-4, A-1-a, A-1-b	2-12	3-21	58-92	23-71	17-57	3-11	0-16	NP-1	
	24-59	Bedrock	---	---	---	---	---	---	---	---	---	---	

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200		
1260: Whiterobe, cool-	<u>In</u>					<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
	0-1	Very gravelly loamy sand	SP-SM	A-1-b	0	0-6	66-70	40-54	30-42	9-13	0-16	NP-1	
	1-11	Very gravelly loamy fine sand, gravelly sand, very gravelly loamy sand, very gravelly sand	SM	A-1-a, A-1-b	0	0-2	60-86	32-78	24-62	8-23	0-18	NP-3	
	11-24	Loamy fine sand, paragravelly sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-2-4	0	0	87-95	54-92	41-75	6-16	0-18	NP-3	
	24-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
1410: Missionwell----													
	0-2	Gravel	SP	A-1-a	0-5	10-35	54-56	3-11	3-10	1-4	17-20	3-4	
	2-3	Extremely gravelly loamy fine sand	SP-SC	A-1-a	0-5	0-27	72-76	17-29	16-27	5-9	17-20	3-4	
	3-8	Very gravelly sandy loam, extremely cobbly fine sandy loam, extremely gravelly sandy loam, very gravelly loam	SC-SM	A-2-4	0-5	0-42	71-79	13-46	9-38	6-25	19-26	4-9	
	8-18	Bedrock	---	---	---	---	---	---	---	---	---	---	
Rock outcrop.													
Missionwell, high elevation-													
	0-2	Gravel	SP	A-1-a	0-5	10-35	53-56	3-10	3-9	1-5	17-23	3-7	
	2-3	Very gravelly fine sandy loam	SC-SM	A-1-b	0-6	0-6	68	27-36	24-34	11-17	17-23	3-7	
	3-8	Very gravelly sandy loam, extremely cobbly fine sandy loam, extremely gravelly sandy loam, very gravelly loam	SC-SM	A-2-4	0-5	0-42	71-79	13-46	9-38	6-25	19-26	4-9	
	8-18	Bedrock	---	---	---	---	---	---	---	---	---	---	

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
1415: Bolero-----	In						Pct	Pct				Pct	
	0-6	Cobbles											
	6-7	Very gravelly loamy fine sand	GW	A-1-a	10-25	25-40	22-47	8-37	7-35	2-12	0-18	NP-3	
			SM	A-1-b	0	0-6	66-75	39-52	36-50	12-19	0-18	NP-3	
	7-12	Extremely gravelly loamy fine sand, very gravelly loamy fine sand	SM	A-2-4	0	7-16	60-80	20-59	18-58	6-21	15-21	1-6	
	12-15	Extremely gravelly loamy fine sand, very gravelly loamy fine sand	SC-SM	A-1-b	0	7-33	67-79	25-58	22-55	7-19	15-21	1-6	
	15-19	Extremely gravelly loamy fine sand, gravel	SP	A-1-a	0-5	5-30	52-57	3-14	3-13	1-5	15-21	1-6	
	19-29	Bedrock		---	---	---	---	---	---	---	---	---	---
Rock outcrop.													
1504: Rizzo, rarely flooded, stony-	0-1	Loamy fine sand	SM	A-2-4	0	0	92-97	84-90	79-88	28-34	0-17	NP-2	
	1-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0-12	0-26	61-81	8-73	4-40	1-15	0-18	NP-3	
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3	
	19-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3	

Table 18.--Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
1504: Rizzo, occasionally flooded, stony-													
	0-2	Gravelly loamy coarse sand	SM	A-1-b	0-6	0-6	74-88	54-81	30-48	11-20	0-18	NP-3	
	2-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0-12	0-26	61-81	8-73	4-40	1-15	0-18	NP-3	
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3	
	19-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3	
1510: Carrizo, very gravelly sandy loam-----													
	0-1	Very gravelly sandy loam	GP-GC, GP-GM, GC-GM	A-1-b, A-2-4, A-1-a	0	0-18	34-53	31-51	21-39	8-17	0-22	NP-6	
	1-5	Extremely gravelly sand, gravelly sand, very gravelly loamy sand	GP-GM, SC-SM, SM	A-1-b, A-2-4, A-1-a	0	0-17	37-65	34-64	26-53	7-19	0-22	NP-6	
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM, GM	A-1-b, A-2-4, A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3	
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP, GP-GM	A-1-a, A-1-b, A-2-4	0	0-26	17-56	13-54	9-38	2-8	0-18	NP-3	



Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
1511: Carrizo, channeled-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
	0-1	Loamy sand	SM	A-2-4	0	0-7	88-97	75-91	59-77	21-31		0-20	NP-4
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sand, gravelly sand	GP-GM	A-1-b	0	0-17	37-65	34-64	23-46	4-11		0-20	NP-4
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8		0-18	NP-3
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM, GP	A-1-a	0	0-21	16-56	13-54	8-38	1-8		0-18	NP-3
Carrizo, occasionally flooded-----													
	0-1	Very gravelly loamy sand	SP-SM	A-1-b	0	0-6	48-71	29-52	22-42	6-14		0-20	NP-4
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sand, gravelly sand	GP-GM	A-1-b	0	0-17	37-65	34-64	23-46	4-11		0-20	NP-4
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8		0-18	NP-3
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM, GP	A-1-a	0	0-21	16-56	13-54	8-38	1-8		0-18	NP-3

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Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
1513: Rubylee----- Carrizo, rarely flooded-----	In											Pct		
	0-2	Fine sandy loam	SC-SM	A-2-4										
	2-5	Fine sandy loam, sandy loam, gravelly sandy loam	SC-SM	A-1-b, A-2-4	0	0	0	89-98	76-95	69-92	28-41	19-26	4-10	
					0	0-4	0-4	79-100	52-98	38-79	15-37	21-29	6-12	
	5-18	Very gravelly sandy loam, fine sandy loam, gravelly sandy loam	SC	A-2-4, A-1-b	0	0-4	0-4	79-100	52-98	37-77	16-39	21-29	6-12	
	18-59	Very gravelly loamy sand, very gravelly sandy loam, gravelly sand, gravelly loamy sand, sand	SM	A-1-b, A-2-4	0-6	0-12	0-12	77-100	47-98	36-89	13-41	0-27	NP-10	
1514: Pintobasin, fine sandy loam	0-1	Gravelly loamy sand	SM	A-1-b	0-2	0-6	0-6	79-91	57-78	45-65	16-26	16-22	2-6	
	1-5	Gravelly sand	SP-SM	A-1-b, A-2-4	0	0-6	0-6	78-92	56-77	37-55	8-16	0-20	NP-4	
	5-59	Very gravelly sand	SP-SM	A-1-a, A-1-b	0	2-11	0	60-78	34-56	22-39	4-8	0-18	NP-3	
	0-2	Fine sandy loam	SM	A-2-4	0	0	0	92-100	78-91	69-85	27-36	16-22	2-6	
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-3, A-1-b	0	0	0	86-100	59-85	46-69	7-13	0-18	NP-3	
	4-24	Gravelly loamy sand, loamy fine sand, loamy sand, sand, gravelly sand	SM	A-2-4	0	0	0	93-100	58-98	54-96	17-33	0-18	NP-3	
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM	A-2-4	0	0	0	93-100	59-98	44-79	13-27	0-18	NP-3	
Rubylee-----	0-2	Fine sandy loam	SC-SM	A-2-4	0	0	0	89-98	76-95	69-92	28-41	19-26	4-10	
	2-5	Fine sandy loam, sandy loam, gravelly sandy loam	SC-SM	A-1-b, A-2-4	0	0-4	0-4	79-100	52-98	38-79	15-37	21-29	6-12	
	5-18	Very gravelly sandy loam, fine sandy loam, gravelly sandy loam	SC	A-2-4, A-1-b	0	0-4	0-4	79-100	52-98	37-77	16-39	21-29	6-12	
	18-59	Very gravelly loamy sand, very gravelly sandy loam, gravelly sand, gravelly loamy sand, sand	SM	A-1-b, A-2-4	0-6	0-12	0-12	77-100	47-98	36-89	13-41	0-27	NP-10	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	Pct	4	10	40		
	<u>In</u>					<u>Pct</u>	<u>Pct</u>						<u>Pct</u>
1515:													
Pintobasin-----													
	0-2	Gravelly loamy fine sand	SM	A-2-4									
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-1-b, A-3	0	0	0	86-100	64-77	61-77	20-28	0-20	NP-4
					0	0	0	86-100	59-85	46-69	7-13	0-18	NP-3
	4-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4	0	0	0	93-100	60-98	46-80	7-16	0-18	NP-3
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4	0	0	0	93-100	60-98	45-79	5-14	0-18	NP-3
Carrizo, occasionally flooded-----													
	0-1	Very gravelly loamy sand	SP-SM	A-1-b	0	0-6	48-71	29-52	22-42	6-14	0-20	NP-4	
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sand, gravelly sand	GP-GM	A-1-b	0	0-17	37-65	34-64	23-46	4-11	0-20	NP-4	
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3	
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM, GP	A-1-a	0	0-21	16-56	13-54	8-38	1-8	0-18	NP-3	
1516:													
Pintobasin, fine sandy loam													
	0-2	Fine sandy loam	SM	A-2-4	0	0	0	92-100	78-91	69-85	27-36	16-22	2-6
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-3, A-1-b	0	0	0	86-100	59-85	46-69	7-13	0-18	NP-3
	4-24	Gravelly loamy sand, loamy fine sand, loamy sand, sand, gravelly sand	SM	A-2-4	0	0	0	93-100	58-98	54-96	17-33	0-18	NP-3
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM	A-2-4	0	0	0	93-100	59-98	44-79	13-27	0-18	NP-3

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>		
1517: Pintobasin-----	0-1	Fine sand	SM	A-2-4			0	0	93-100	78-92	73-90	14-20	0-18	NP-3
	1-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-1-b, A-3			0	0	86-100	59-85	46-69	7-13	0-18	NP-3
	4-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SP-SM	A-3, A-2-4, A-1-b			0	0	93-100	60-98	46-80	7-16	0-18	NP-3
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b			0	0	93-100	60-98	45-79	5-14	0-18	NP-3
Dalelake-----	0-4	Fine sand	SP-SM	A-2-4			0	0	99-100	91-100	85-95	11-14	0-14	NP
	4-59	Fine sand	SP-SM	A-2-4			0	0	99-100	91-100	85-95	11-14	0-14	NP
1520: Pintobasin, loamy sand-----	0-2	Loamy sand	SM	A-2-4										
	2-14	Loamy sand, sand, gravelly loamy sand	SM	A-1-b, A-2-4			0	0-7	93-98	73-92	57-79	22-35	0-22	NP-6
	14-35	Loamy fine sand, sand, gravelly sand	SM, SP-SM	A-2-4, A-1-b, A-3			0	0	87-100	60-97	46-80	5-14	0-18	NP-3
	35-59	Loamy fine sand, sand, gravelly sand	SM, SW-SM	A-1-b, A-2-4, A-3			0	0-2	87-100	60-97	46-80	8-17	0-18	NP-3
1522: Pintobasin, rarely flooded-	0-2	Gravelly sand	SP-SM, SM	A-2-4										
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-1-b, A-3			0	0	92	71-77	55-66	10-17	0-22	NP-6
	4-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-1-b, A-2-4, A-3			0	0	93-100	60-98	46-80	7-16	0-18	NP-3
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b			0	0	93-100	60-98	45-79	5-14	0-18	NP-3

Soil Survey of Joshua Tree National Park, California

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
1523: Pintobasin, rarely flooded-													
	0-2	Gravelly sand	SP-SM, SM	A-2-4	0	0	92	71-77	55-66	10-17	0-22	NP-6	
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-3, A-1-b	0	0	86-100	59-85	46-69	7-13	0-18	NP-3	
	4-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	46-80	7-16	0-18	NP-3	
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	45-79	5-14	0-18	NP-3	
Aquapeak-----	0-0	Very gravelly fine sand	SP-SM	A-1-b	0	0	63-73	34-54	32-52	6-11	0-18	NP-3	
	0-11	Loam, fine sandy loam, gravelly sandy loam	SC	A-2-6	0	0-6	73-97	52-92	44-87	16-37	19-28	4-11	
	11-19	Cemented very gravelly loamy sand, cemented gravelly loamy sand	SM	A-2-4	0-11	0-11	69-93	38-78	29-66	9-24	0-22	NP-6	
	19-33	Very gravelly loamy sand, sand, gravelly loamy sand	SM	A-2-4	0-11	0-11	69-97	38-92	29-77	9-28	0-22	NP-6	
	33-59	Very gravelly loamy sand, sand, gravelly sand	SP-SM	A-1-b	0-11	0-11	69-97	38-92	30-80	5-20	0-22	NP-6	
Pintobasin, occasionally flooded-----	0-2	Gravelly sand	SP-SM, SC-SM	A-2-4	0	0	92	71-77	55-66	10-17	0-22	NP-6	
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-3, A-1-b	0	0	86-100	59-85	46-69	7-13	0-18	NP-3	
	4-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	46-80	7-16	0-18	NP-3	
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	45-79	5-14	0-18	NP-3	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
1524: Pintobasin, rarely flooded-	In					Pct	Pct						Pct	
	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0	0	92-100	79-92	61-76	7-14	0-20	NP-4	
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-1-b, A-3	0	0	0	86-100	59-85	46-69	7-13	0-18	NP-3	
	4-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	0	93-100	60-98	46-80	7-16	0-18	NP-3	
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	0	93-100	60-98	45-79	5-14	0-18	NP-3	
1525: Pintobasin, occasionally flooded-----														
	0-2	Gravelly sand	SP-SM, SM	A-2-4	0	0	0	92	71-77	55-66	10-17	0-22	NP-6	
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-3, A-1-b	0	0	0	86-100	59-85	46-69	7-13	0-18	NP-3	
	4-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	0	93-100	60-98	46-80	7-16	0-18	NP-3	
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	0	93-100	60-98	45-79	5-14	0-18	NP-3	
Pintobasin, rarely flooded-														
	0-2	Loamy sand	SM	A-2-4	0	0-7	0	93-98	73-92	57-79	22-35	0-22	NP-6	
	2-14	Loamy sand, sand, gravelly loamy sand	SM	A-1-b, A-2-4	0	0	0	87-97	60-85	46-69	15-24	0-18	NP-3	
	14-35	Loamy fine sand, sand, gravelly sand	SM, SP-SM	A-2-4, A-1-b, A-3	0	0	0	87-100	60-97	46-80	5-14	0-18	NP-3	
	35-59	Loamy fine sand, sand, gravelly sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0-2	0	87-100	60-97	46-80	8-17	0-18	NP-3	



Soil Survey of Joshua Tree National Park, California

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
1526: Pintobasin, rarely flooded-													
	0-3	Loamy fine sand	SM	A-2-4	0	0	92-100	77-92	71-90	21-31	0-20	NP-4	
	3-7	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SM	A-1-b, A-2-4	0	0	86-96	59-85	45-68	14-23	0-18	NP-3	
	7-20	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-2-4, A-1-b	0	0	93-100	60-98	45-79	6-15	0-18	NP-3	
	20-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	45-79	5-14	0-18	NP-3	
Joetree-----	0-2	Loamy sand	SM	A-2-4	0	0	92-100	77-98	58-79	20-30	0-18	NP-3	
	2-43	Coarse sand, loamy coarse sand, loamy sand, gravelly sand	SM	A-2-4	0	0	73-100	59-98	44-78	13-26	0-18	NP-3	
	43-65	Sandy loam, sandy clay loam	SC	A-6	0	0	95-100	76-98	62-92	35-57	26-38	10-19	
	65-71	Loamy sand	SM	A-2-4	0	0	95-100	85-98	66-80	18-25	15-19	1-4	
Patscamp-----	0-1	Loamy fine sand	SM	A-2-4	0	0	92-97	78-92	73-89	25-33	0-18	NP-3	
	1-10	Loamy sand, sand, gravelly sand	SP-SM	A-3	0	0	93-95	78-92	60-76	7-13	0-18	NP-3	
	10-17	Gravelly sandy clay loam, sandy clay loam	CL	A-6	0	0	92-98	76-91	63-81	39-53	30-36	13-17	
	17-35	Gravelly sandy clay loam, sandy clay loam	SC	A-2-6	0	0	93-97	57-84	49-76	29-47	30-35	13-16	
	35-45	Gravelly sandy loam, sandy loam	SC	A-6	0	0	92-100	77-95	59-73	35-43	28-28	11	
	45-53	Gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	85-98	70-92	51-73	25-39	19-26	4-9	
1527: Pintobasin, moist-----	53-63	Gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	85-95	70-84	48-64	19-28	19-25	4-9	
	0-2	Loamy sand	SM	A-2-4	0	0-7	93-98	73-92	57-79	22-35	0-22	NP-6	
	2-14	Loamy sand, sand, gravelly loamy sand	SM	A-1-b, A-2-4	0	0	87-97	60-85	46-69	15-24	0-18	NP-3	
	14-35	Loamy fine sand, sand, gravelly sand	SM, SP-SM	A-2-4, A-1-b, A-3	0	0	87-100	60-97	46-80	5-14	0-18	NP-3	
	35-59	Loamy fine sand, sand, gravelly sand	SM, SW-SM	A-1-b, A-2-4, A-3	0	0-2	87-100	60-97	46-80	8-17	0-18	NP-3	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--						Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200	Pct	Pct		
1530: Dalelake, fine sand-----	In													
	0-4	Fine sand	SP-SM	A-2-4	0	0	99-100	91-100	85-95	11-14	0-14	NP		
	4-59	Fine sand	SP-SM	A-2-4	0	0	99-100	91-100	85-95	11-14	0-14	NP		
1531: Dalelake-----	In													
	0-2	Fine sand	SP-SM	A-2-4	0	0	98-100	91-100	85-97	10-14	0-16	NP-1		
	2-13	Fine sand	SP-SM	A-2-4	0	0	98-100	91-100	85-97	10-14	0-16	NP-1		
Pintobasin, rarely flooded-	In													
	0-2	Gravelly sand	SC-SM, SP-SM	A-2-4	0	0	92	71-77	55-66	10-17	0-22	NP-6		
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-1-b, A-3	0	0	86-100	59-85	46-69	7-13	0-18	NP-3		
1540: Carrizo, very rarely flooded-	In													
	4-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-2-4, A-1-b	0	0	93-100	60-98	46-80	7-16	0-18	NP-3		
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-2-4, A-1-b	0	0	93-100	60-98	45-79	5-14	0-18	NP-3		
1540: Carrizo, very rarely flooded-	In													
	0-1	Very gravelly sandy loam	GP-GC	A-1-a	0	0-18	34-53	31-51	21-39	8-17	0-22	NP-6		
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sandy loam, gravelly sand	GC-GM	A-1-b	0	0-17	37-65	34-64	23-47	7-19	0-22	NP-6		
1540: Carrizo, very rarely flooded-	In													
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3		
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP	A-1-a	0	0-26	17-56	13-54	9-38	2-8	0-18	NP-3		

Soil Survey of Joshua Tree National Park, California

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>					Pct	<u>Pct</u>						<u>Pct</u>	
1540:														
Carrizo, stable-	0-1	Fine sandy loam	SC-SM	A-2-4		0	0-7	88-97	75-91	166-84	25-35	16-22	2-6	
	1-5	Very gravelly loamy sand, extremely gravelly sand, gravelly sand	GM, GP-GM, SP-SM, SM	A-1-b, A-2-4, A-1-a		0	0-17	37-65	34-64	126-52	7-18	0-20	NP-4	
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a		0	0-17	36-46	33-43	122-30	4-8	0-18	NP-3	
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP, GP-GM, SP, SP-SM	A-1-a		0	0-26	17-56	13-54	9-38	2-8	0-18	NP-3	
Carrizo, occasionally flooded, rocky surface-----	0-1	Gravelly loamy sand	SM	A-1-b		0-2	0-6	79-91	57-78	145-65	16-26	16-22	2-6	
	1-5	Gravelly sand	SP-SM	A-1-b, A-2-4		0	0-6	78-92	56-77	137-55	8-16	0-20	NP-4	
	5-59	Very gravelly sand	SP-SM	A-1-a, A-1-b		0	2-11	60-78	34-56	122-39	4-8	0-18	NP-3	
Russiroks-----	0-1	Gravel	GP	A-2-6		0-3	5-20	20-24	0-6	0-6	0-5	122-28	7-12	
	1-2	Gravelly silt loam	CL	A-6		0	0-7	78-83	55-75	149-71	43-63	122-29	7-12	
	2-7	Very gravelly loam	SC	A-2-4		0-6	4-12	60-79	34-53	128-48	20-34	22-27	7-10	
	7-30	Extremely gravelly sandy loam	GW-GM	A-1-a		2-10	5-16	42-47	13-27	110-21	4-10	17-22	3-6	
	30-59	Extremely gravelly sandy loam	GW	A-1-a		2-10	5-16	39-50	13-27	110-21	4-9	17-22	3-6	
1541:														
Carrizo, stable-	0-1	Fine sandy loam	SC-SM	A-2-4		0	0-7	88-97	75-91	166-84	25-35	16-22	2-6	
	1-5	Very gravelly loamy sand, extremely gravelly sand, gravelly sand	GC-GM, GP-GM, SP-SM, SM	A-1-b, A-2-4, A-1-a		0	0-17	37-65	34-64	126-52	7-18	0-20	NP-4	
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a		0	0-17	36-46	33-43	122-30	4-8	0-18	NP-3	
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP, GP-GM, SP, SP-SM	A-1-a		0	0-26	17-56	13-54	9-38	2-8	0-18	NP-3	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
1541: Cambidic Haplodurids----	In				Pct	Pct						Pct	
	0-2	Gravel	GP	A-2-4	0	2-26	29-34	0-15	0-12	0-8	18-23	4-7	
	2-2	Gravelly loam	SC-SM	A-4	0	0-7	84-92	54-76	44-65	29-44	19-24	4-7	
	2-5	Gravelly fine sandy loam	SC-SM	A-4	0	0	79-92	52-77	43-66	23-37	17-21	3-6	
	5-16	Extremely gravelly sand, extremely gravelly loamy sand	SW-SM	A-1-a	0	0-11	51-59	13-29	10-24	3-8	0-17	NP-3	
	16-20	Cemented loamy sand	SM	A-2-4	0	0	92-100	85-100	63-79	18-26	0-17	NP-3	
	20-59	Very gravelly loamy sand	SP-SM	A-1-b	0	0-11	71-80	29-54	23-44	8-18	0-17	NP-3	
1542: Carrizo, very rarely flooded-													
	0-1	Sandy loam	SM	A-2-4	0	0	88-95	75-91	55-74	25-37	0-22	NP-6	
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sandy loam, gravelly sand	GC-GM	A-1-b	0	0-17	37-65	34-64	23-47	7-19	0-22	NP-6	
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3	
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP	A-1-a	0	0-26	17-56	13-54	9-38	2-8	0-18	NP-3	
Carrizo, occasionally flooded-----													
	0-1	Very gravelly loamy sand	SP-SM	A-1-b	0	0-6	48-71	29-52	22-42	6-14	0-20	NP-4	
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sand, gravelly sand	GP-GM	A-1-b	0	0-17	37-65	34-64	23-46	4-11	0-20	NP-4	
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3	
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM, GP	A-1-a	0	0-21	16-56	13-54	8-38	1-8	0-18	NP-3	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
1550: Buzzardsprings, stable-----													
	0-3	Fine sandy loam	SM	A-2-4									
	3-25	Gravelly loamy sand, loamy sand	SM	A-2-4	0	0	92-100	84-95	74-87	29-35	16-20	2-4	
					0	0	92-100	77-84	57-69	18-25	0-19	NP-4	
	25-59	Sand, gravelly sand, loamy sand	SP-SM	A-1-b	0	0-6	86-98	59-91	46-75	5-13	0-18	NP-3	
Coxpin-----	0-1	Loamy fine sand	SM	A-2-4	0	0	93-99	78-92	70-89	24-33	0-20	NP-4	
	1-10	Fine sandy loam, sand, loamy fine sand, gravelly sandy loam	SC-SM	A-2-4	0	0	92-100	77-98	54-77	22-36	15-23	1-7	
	10-17	Sand, gravelly loamy sand, fine sandy loam, loamy fine sand, gravelly sandy loam	SM	A-1-b	0	0-6	80-92	54-85	40-68	11-23	0-19	NP-3	
	17-22	Gravelly sandy loam Cemented gravelly loamy sand, cemented sand	SM	A-2-4	0	0	87-100	56-98	43-80	7-17	0-16	NP-2	
	22-59	Gravelly sand, sand	SP-SM	A-2-4	0	0-6	80-100	60-98	46-81	8-18	0-17	NP-2	
Dalelake-----	0-4	Fine sand	SP-SM	A-2-4	0	0	99-100	91-100	85-95	11-14	0-14	NP	
	4-59	Fine sand	SP-SM	A-2-4	0	0	99-100	91-100	85-95	11-14	0-14	NP	
1555: Goldrose-----													
	0-1	Gravelly loamy fine sand	SM	A-2-4	0-6	0-13	98-100	61-82	57-79	18-26	15-18	1-3	
	1-6	Gravelly loamy sand, gravelly sand	SP-SM	A-2-4	0	0-6	87-95	54-78	43-65	9-15	0-18	NP-3	
	6-21	Gravelly sand	SP-SM	A-3	0	0-13	81-93	50-71	39-58	6-11	0-16	NP-1	
	21-31	Gravelly loamy coarse sand, gravelly coarse sand	SW	A-1-b	0	0-12	82-95	52-73	22-33	3-7	0-16	NP-1	
	31-59	Very gravelly loamy coarse sand, very gravelly coarse sand	SW	A-1-a	0-1	0-11	79-87	31-55	13-25	2-5	0-16	NP-1	
Carsitas, very rarely flooded-													
	0-1	Gravelly sand	SP-SM	A-2-4, A-1-b	0	0-3	87-97	54-78	41-63	7-12	0-17	NP-2	
	1-59	Coarse sand, loamy sand, gravelly loamy coarse sand, gravelly sand	SP-SM	A-3, A-2-4, A-1-b	0	0-6	83-100	48-89	37-72	6-14	0-17	NP-2	

Table 18.-Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
1555: Chemwash, rarely flooded-	0-2	Gravelly loamy coarse sand	SM, SW-SM	A-1-b	0	0	187-96	54-78	27-43	8-16		0-18	NP-3
	2-67	Stratified extremely gravelly coarse sand to very gravelly loamy coarse sand	SP-SM, SP	A-1-a	0-5	0-11	79-88	27-55	12-28	2-7		0-17	NP-3
2003: Emptygun-----	0-2	Very gravelly loamy sand	SM	A-1-b	0	0	47-67	29-53	23-47	10-22		15-23	1-7
	2-10	Gravelly sandy loam	SC-SM	A-1-b	0	0-11	79-92	52-77	38-59	16-26		18-22	3-6
	10-20	Very gravelly loamy sand	GM, SM	A-1-b	0	0	47-73	29-54	23-46	8-19		17-23	3-7
	20-60	Extremely gravelly loamy sand, very gravelly sand, very gravelly loamy sand, extremely gravelly sand	GP-GM, SM	A-1-b	0	6-12	52-85	22-55	17-45	5-16		0-17	NP-3
2060: Joetree, very rarely flooded-	0-2	Loamy fine sand	SM	A-2-4	0	0	92-100	84-98	78-96	24-33		0-18	NP-3
	2-39	Sand, loamy coarse sand, loamy sand, gravelly sand	SM	A-2-4	0	0	73-100	59-98	46-81	8-18		0-18	NP-3
	39-59	Sandy loam, sandy clay loam	SC	A-6	0	0	95-100	76-98	58-87	37-59		26-38	10-19
	59-71	Loamy sand	SM	A-2-4	0	0	95-100	85-98	66-80	18-25		15-19	1-4
Dalelake-----	0-4	Fine sand	SP-SM	A-2-4	0	0	99-100	91-100	85-95	11-14		0-14	NP
	4-59	Fine sand	SP-SM	A-2-4	0	0	99-100	91-100	85-95	11-14		0-14	NP
Pintobasin, fine sandy loam	0-2	Fine sandy loam	SM	A-2-4	0	0	92-100	78-91	69-85	27-36		16-22	2-6
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-3, A-1-b	0	0	86-100	59-85	46-69	7-13		0-18	NP-3
	4-24	Gravelly loamy sand, loamy fine sand, loamy sand, sand, gravelly sand	SM	A-3, A-2-4	0	0	93-100	58-98	54-96	17-33		0-18	NP-3
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM	A-3, A-2-4	0	0	93-100	59-98	44-79	13-27		0-18	NP-3

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
2065: Dalelake-----	0-4	Fine sand	SP-SM	A-2-4	0	0	99-100	91-100	85-95	11-14	0-14	NP	
	4-59	Fine sand	SP-SM	A-2-4	0	0	99-100	91-100	85-95	11-14	0-14	NP	
	0-2	Gravel	GW	A-8	0-5	4-30	20-28	1-14	1-12	0-7	18-26	4-9	
	2-3	Gravelly fine sandy loam	SC	A-2-4	0	0	70-90	45-76	37-68	19-38	19-26	4-9	
	3-11	Loam, fine sandy loam, gravelly sandy loam	SC	A-2-6	0	0-6	73-97	52-92	44-87	16-37	19-28	4-11	
Aquapeak-----	11-19	Cemented very gravelly loamy sand, cemented	SM	A-2-4	0-11	0-11	69-93	38-78	29-66	9-24	0-22	NP-6	
	19-33	Gravelly loamy sand Very gravelly loamy sand, sand, gravelly loamy sand	SM	A-2-4	0-11	0-11	69-97	38-92	29-77	9-28	0-22	NP-6	
	33-59	Very gravelly loamy sand, sand, gravelly sand	SP-SM	A-1-b	0-11	0-11	69-97	38-92	30-80	5-20	0-22	NP-6	
	0-1	Fine sand	SM	A-2-4	0	0	93-100	78-92	73-90	11-17	0-18	NP-2	
	1-10	Fine sandy loam, sand, loamy fine sand, gravelly sandy loam	SC-SM	A-2-4	0	0	92-100	77-98	54-77	22-36	15-23	1-7	
Coxpin-----	10-17	Sand, gravelly loamy sand, fine sandy loam, loamy fine sand, gravelly sandy loam	SM	A-1-b	0	0-6	80-92	54-85	40-68	11-23	0-19	NP-3	
	17-22	Cemented gravelly loamy sand, cemented sand	SM	A-2-4	0	0	87-100	56-98	43-80	7-17	0-16	NP-2	
	22-59	Gravelly sand, sand	SP-SM	A-2-4	0	0-6	80-100	60-98	46-81	8-18	0-17	NP-2	
	0-4	Very gravelly loam	SC-SM	A-1-b, A-2-4	0	0	62-72	31-50	25-45	17-31	19-26	4-9	
	4-9	Sandy loam, loam	SC-SM, CL	A-6, A-4	0	0	84-92	84-91	66-82	43-56	21-30	6-13	
2067: Aquapeak, overblown-----	9-13	Loam, sandy loam	SC	A-6	0	0	85-92	84-92	58-72	31-44	21-30	6-13	
	13-19	Cemented gravelly sandy loam	SC, SC-SM	A-2-4	0	0	71-78	70-77	48-58	27-35	18-25	4-9	
	19-43	Gravelly loamy sand	SM, SC-SM	A-1-b, A-2-4	0	0	61-79	59-78	46-66	16-27	0-21	NP-5	
	43-47	Gravelly sandy loam, cemented	SC-SM	A-1-b, A-2-4	0	0	59-78	58-77	41-60	23-37	19-25	4-9	
	47-59	Loamy sand, gravelly sand	SP-SM, SM	A-3, A-1-b, A-2-4	0	0	62-93	60-92	47-77	8-17	0-19	NP-4	



Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
2067:													
Buzzardsprings--	0-1	Gravelly fine sand	SP-SM, SM	A-2-4, A-3									
	1-3	Sandy loam, gravelly loamy sand, loamy sand, fine sand, sand	SM	A-2-4	0	0-6	87-93	61-78	56-76	7-13	0-18	NP-3	
					0	0	93-100	78-98	70-98	18-31	0-21	NP-6	
	3-8	Sand, gravelly loamy sand, sandy loam, loamy fine sand	SM	A-2-4	0	0	93-100	78-98	70-97	18-32	0-21	NP-6	
	8-23	Sand, sandy loam, loamy sand, gravelly loamy sand	SP-SM	A-2-4	0	0	93-98	75-92	56-74	7-13	0-18	NP-3	
	23-60	Sand, gravelly sand, loamy sand	SP-SM	A-1-b	0	0-6	86-98	59-91	45-74	5-12	0-18	NP-3	
Dalelake, thick sandy surface--	0-2	Fine sand	SP-SM	A-2-4									
	2-13	Fine sand	SP-SM	A-2-4	0	0	98-100	91-100	85-97	10-14	0-16	NP-1	
	13-22	Fine sand	SP-SM	A-2-4	0	0	98-100	91-100	85-97	10-14	0-16	NP-1	
	22-59	Fine sand	SP-SM	A-2-4	0	0	98-100	91-100	85-97	10-14	0-16	NP-1	
Buzzardsprings, steep-----	0-1	Gravelly loamy sand	SM	A-2-4									
	1-3	Sandy loam, gravelly loamy sand, loamy sand, fine sand, sand	SM	A-2-4	0	0-6	86-92	57-77	45-63	14-21	16-20	2-4	
					0	0	93-100	78-98	70-98	18-31	0-21	NP-6	
	3-8	Sand, gravelly loamy sand, sandy loam, loamy fine sand	SM	A-2-4									
					0	0	93-100	78-98	70-97	18-32	0-21	NP-6	
	8-23	Sand, sandy loam, loamy sand, gravelly loamy sand	SP-SM	A-2-4									
					0	0	93-98	75-92	56-74	7-13	0-18	NP-3	
	23-60	Sand, gravelly sand, loamy sand	SP-SM	A-1-b									
					0	0-6	86-98	59-91	45-74	5-12	0-18	NP-3	
2068:													
Aquapeak-----	0-0	Very gravelly fine sand	SP-SM	A-1-b									
	0-11	Loam, fine sandy loam, gravelly sandy loam	SC	A-2-6	0	0	63-73	34-54	32-52	6-11	0-18	NP-3	
					0	0-6	73-97	52-92	44-87	16-37	19-28	4-11	
	11-19	Cemented very gravelly loamy sand, cemented gravelly loamy sand	SM	A-2-4	0-11	0-11	69-93	38-78	29-66	9-24	0-22	NP-6	
	19-33	Very gravelly loamy sand, sand, gravelly loamy sand	SM	A-2-4	0-11	0-11	69-97	38-92	29-77	9-28	0-22	NP-6	
	33-59	Very gravelly loamy sand, sand, gravelly sand	SP-SM	A-1-b	0-11	0-11	69-97	38-92	30-80	5-20	0-22	NP-6	

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
2068: Carpetflat, nongravelly surface-----	In				Pct	Pct					Pct			
	0-0	Gravelly fine sand	SP-SM	A-3	0	0	80-93	54-78	49-74	7-12	0-16	NP-1		
	0-4	Gravelly sandy loam	SC-SM	A-1-b, A-2-4	0	0	73-85	52-70	39-56	18-27	19-23	4-7		
	4-15	Cemented loamy sand	SM	A-2-4	0	0	92-100	78-100	58-79	19-29	0-18	NP-3		
	15-61	Loamy sand, gravelly coarse sand, gravelly sand, sand	SP-SM	A-1-b	0	0	93-100	59-92	46-76	5-13	0-17	NP-1		
Pintobasin-----	0-1	Fine sand	SM	A-2-4	0	0	93-100	78-92	73-90	14-20	0-18	NP-3		
	1-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-3, A-1-b	0	0	86-100	59-85	46-69	7-13	0-18	NP-3		
	4-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	46-80	7-16	0-18	NP-3		
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	45-79	5-14	0-18	NP-3		
2070: Missionsweet----	0-2	Gravel	SP	A-1-a	0-5	11-35	54-58	3-10	2-9	2-7	18-25	4-9		
	2-3	Very gravelly loam	SC-SM	A-1-b, A-2-4	0	4-13	65-77	30-50	26-46	18-33	19-25	4-9		
	3-11	Extremely gravelly sandy loam, extremely gravelly loam	SC-SM	A-1-a, A-1-b, A-2-4	0	2-17	61-73	22-32	19-28	14-21	19-22	4-7		
	11-17	Extremely gravelly sandy loam, extremely gravelly loam	GW-GC	A-1-a, A-1-b	0	2-15	45-77	10-48	8-40	5-26	19-23	4-7		
	17-27	Cemented material	---	---	---	---	---	---	---	---	---	---		
	0-2	Gravel	SP	A-2-6	0-5	11-25	56-63	0-14	0-13	0-11	20-30	6-13		
	2-4	Very gravelly sandy loam, gravelly silt loam	SC, CL	A-6	0	0-10	71-92	36-75	32-71	27-60	26-31	10-13		
	4-7	Gravelly silt loam, very gravelly sandy loam	SP-SC	A-1-a, A-2-4, A-1-b	0	0-6	69-85	32-70	24-54	10-24	19-23	4-7		
	7-13	Very gravelly sandy loam, gravelly sandy loam	SC-SM	A-1-b, A-2-4	0	0-6	69-85	32-70	24-56	11-27	19-23	4-7		
	13-16	Cemented loamy sand	SM	A-2-4	0	0	92-100	78-100	58-79	19-29	0-18	NP-3		
16-26	Cemented material	---	---	---	---	---	---	---	---	---	---			

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
2075: Oldale-----	In				Pct	Pct						Pct		
	0-2	Gravel	GP-GC	A-2-6	0-3	16-25	7-17	3-14	3-13	2-11	25-30	9-13		
	2-3	Very gravelly silt loam	SC	A-2-4, A-2-6	0	0-18	67-71	28-42	25-40	21-34	25-31	9-13		
	3-6	Sandy loam, very gravelly loam, gravelly silt loam, loam	CL	A-6	0	0-13	70-96	40-91	35-85	29-70	25-31	9-13		
	6-15	Extremely gravelly loam	GC, SC	A-2-6	0	0-27	62-73	17-46	14-41	10-31	25-35	10-17		
	15-27	Extremely gravelly sandy loam	SP-SC	A-2-4	0	0-27	63-73	18-47	13-38	6-19	20-28	6-12		
	27-59	Very gravelly sand, very gravelly loamy sand	SM	A-1-b	0	0-17	65-79	29-57	22-47	7-18	0-19	NP-4		
	0-2	Gravel	SP	A-1-a	0-5	11-35	54-58	3-10	2-9	2-7	18-25	4-9		
	2-3	Very gravelly loam	SC-SM	A-1-b, A-2-4	0	4-13	65-77	30-50	26-46	18-33	19-25	4-9		
	3-11	Extremely gravelly sandy loam, extremely gravelly loam	SC-SM	A-1-a, A-1-b, A-2-4	0	2-17	61-73	22-32	19-28	14-21	19-22	4-7		
Missionsweet----- 2076: Oldale-----	11-17	Extremely gravelly sandy loam, extremely gravelly loam	GW-GC	A-1-a, A-1-b	0	2-15	45-77	10-48	8-40	5-26	19-23	4-7		
	17-27	Cemented material	---	---	---	---	---	---	---	---	---	---		
	0-2	Gravel	GW	A-2-6	0-5	16-25	7-18	3-14	3-13	2-10	25-30	9-13		
	2-4	Extremely gravelly loam	SC	A-2-4, A-2-6	0	0-17	64-66	23-31	20-28	15-22	25-30	9-13		
	4-7	Sandy loam, very gravelly loam, gravelly silt loam, loam	CL	A-6	0	0-13	70-96	40-91	35-85	29-70	25-31	9-13		
	7-16	Extremely gravelly loam	GC, SC	A-2-6	0	0-27	62-73	17-46	14-41	10-31	25-35	10-17		
	16-28	Extremely gravelly sandy loam	SP-SC	A-2-4	0	0-27	63-73	18-47	13-38	6-19	20-28	6-12		
	28-59	Very gravelly sand, very gravelly loamy sand	SM	A-1-b	0	0-17	65-79	29-57	22-47	7-18	0-19	NP-4		

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>					Pct <td>Pct<td></td><td></td><td></td><td></td><td>Pct<td></td></td></td>	Pct <td></td> <td></td> <td></td> <td></td> <td>Pct<td></td></td>					Pct <td></td>		
2076: Carrizo-----														
	0-1	Very gravelly sandy loam	GP-GC, GC-GM, GP-GM	A-1-b, A-2-4, A-1-a	0	0-18	34-53	31-51	21-39	8-17	0-22	NP-6		
	1-5	Extremely gravelly sand, gravelly sand, very gravelly loamy sand	GC-GM, SC-SM, GP-GM	A-1-b, A-2-4, A-1-a	0	0-17	37-65	34-64	25-52	7-18	0-22	NP-6		
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM, GM, SP-SM, SM	A-1-b, A-2-4, A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3		
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-2-4	0	0-26	17-56	13-54	9-38	2-8	0-18	NP-3		
2077: Oldale-----														
	0-2	Gravel	GW-GC	A-2-6	0-3	15-25	5-17	1-14	1-13	1-11	25-30	9-13		
	2-3	Very gravelly silt loam	SC	A-2-4, A-2-6	0	0-18	67-71	28-42	25-40	21-34	25-31	9-13		
	3-6	Sandy loam, very gravelly loam, gravelly silt loam, loam	CL	A-6	0	0-13	70-96	40-91	35-85	29-70	25-31	9-13		
	6-9	Extremely gravelly loam	GC, SC	A-2-6	0	0-27	62-73	17-46	14-41	10-31	25-35	10-17		
Carrizo-----	9-16	Extremely gravelly sandy loam	SP-SC	A-2-4	0	0-27	63-73	18-47	13-38	6-19	20-28	6-12		
	16-59	Very gravelly sand, very gravelly loamy sand	SM	A-1-b	0	0-17	65-79	29-57	22-47	7-18	0-19	NP-4		
	0-1	Fine sandy loam	SC-SM	A-2-4	0	0-7	88-97	75-91	66-84	25-35	16-22	2-6		
	1-5	Very gravelly loamy sand, extremely gravelly sand, gravelly sand	GC-GM, GP-GM, SM	A-1-b, A-2-4, A-1-a	0	0-17	37-65	34-64	26-52	7-18	0-20	NP-4		
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3		
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP, GP-GM, SP, SP-SM	A-1-a	0	0-26	17-56	13-54	9-38	2-8	0-18	NP-3		

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
2077: Carrizo, very rarely flooded-													
	0-1	Very gravelly sandy loam	GP-GC	A-1-a	0	0-18	34-53	31-51	21-39	8-17	0-22	NP-6	
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sandy loam, gravelly sand	GC-GM	A-1-b	0	0-17	37-65	34-64	23-47	7-19	0-22	NP-6	
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3	
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP	A-1-a	0	0-26	17-56	13-54	9-38	2-8	0-18	NP-3	
2085: Rainbow send----	0-6	Stones	SP-SM	A-1-a	0-31	20-37	52-69	4-38	3-31	1-11	15-20	1-4	
	6-7	Very gravelly loamy sand	SM	A-1-a, A-1-b	0	7-17	68-85	26-55	20-44	6-15	15-20	1-4	
	7-15	Very gravelly fine sandy loam	SC-SM, SP-SM	A-1-a, A-1-b, A-2-4	0	7-17	58-80	30-57	26-54	10-23	17-23	3-7	
	15-18	Very gravelly sandy loam	SC-SM	A-1-a, A-1-b, A-2-4	0	6-23	66-93	32-56	24-44	10-20	19-23	4-7	
	18-28	Cemented material	----	----	----	----	----	----	----	----	----	----	
	0-2	Gravel	GW	A-1-a	0-5	10-25	13-22	0-11	0-10	0-6	20-28	4-11	
	2-3	Extremely gravelly fine sandy loam	GP-GC	A-2-4	0	6-11	55-60	21-30	18-29	10-17	22-28	7-11	
	3-11	Gravelly loam, very gravelly sandy loam, very gravelly loam	SC	A-2-6	0-2	0-18	61-85	38-69	27-55	15-33	25-32	9-14	
	11-16	Cemented very gravelly loamy sand, cemented very gravelly sand	SP-SM	A-1-b	0-2	0-11	66-75	38-57	29-45	3-6	0-15	NP-1	
16-59	Extremely gravelly sand	SP	A-1-a	0	0-5	58-63	20-31	16-25	1-3	0-14	NP		

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
Q090: Deprave-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
	0-2	Gravel	GP		0-5	6-35	24-28	0-6	0-6	0-4	22-28	7-11	
	2-4	Gravelly loam	SC		0-7	0-21	72-76	50-61	42-54	29-39	22-28	7-11	
	4-15	Extremely gravelly coarse sandy loam, very gravelly sandy loam, very gravelly sandy clay loam	SC		0-5	0-17	58-78	24-52	19-49	10-29	25-37	9-18	
	15-39	Very gravelly loamy coarse sand, extremely gravelly sandy loam, very gravelly loamy sand, very gravelly sand	SP-SM		0-2	0-16	45-73	15-59	11-46	3-14	0-16	NP-1	
		39-63	Very gravelly coarse sand, cemented, very gravelly sand, cemented	SP		0-2	0-17	54-71	28-57	21-45	2-6	0-14	NP
Rockhound-----	0-2	Extremely gravelly loam	GW		1-3	10-17	18-23	0-11	0-10	0-7	18-27	4-10	
	2-4	Very gravelly loam	SC		0-2	0-7	70-77	48-54	39-49	27-35	19-27	4-10	
	4-7	Extremely gravelly sandy loam, very gravelly loam	SC		0-2	0-13	59-67	24-41	21-37	14-25	25-30	9-13	
	7-17	Gravelly loam, very gravelly loam	SC		0-3	0-19	76-85	45-63	36-56	26-42	28-35	12-17	
	17-34	Extremely gravelly sandy clay loam, very gravelly loam	SP-SC		0-3	0-17	59-79	23-51	19-46	10-26	27-35	12-17	
	34-59	Very gravelly sand, extremely gravelly loamy sand, very gravelly sandy loam	SC		0-2	0-13	59-74	25-52	15-41	5-20	0-29	NP-13	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>					<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
2090: Rizzo-----	0-1	Extremely cobbly sandy loam	SP-SM	A-1-a		6-11	13-28	58-77	16-40	11-33	5-16	16-24	2-9	
	1-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b		0-12	0-26	61-81	8-73	4-40	1-15	0-18	NP-3	
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3		
	19-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3		
2091: Deprave-----	0-1	Gravel	GP	A-2-4		0-5	6-35	24-28	0-6	0-6	0-4	22-28	7-11	
	1-2	Gravelly loam	SC	A-4		0-7	0-21	72-76	50-61	42-54	29-39	22-28	7-11	
	2-13	Extremely gravelly coarse sandy loam, very gravelly sandy loam, very gravelly sandy clay loam	SC	A-2-6		0-5	0-17	58-78	24-52	19-49	10-29	25-37	9-18	
	13-24	Very gravelly loamy coarse sand, extremely gravelly sandy loam, very gravelly loamy sand, very gravelly sand	SP-SM	A-1-a		0-2	0-16	45-73	15-59	11-46	3-14	0-16	NP-1	
	24-63	Very gravelly coarse sand, cemented, very gravelly sand, cemented	SP	A-1-a		0-2	0-17	54-71	28-57	21-45	2-6	0-14	NP	



Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
2091: Roostertail-----													
	0-1	Gravel	SP	A-2-4	0-15	1-30	0-55	0-5	0-5	0-3	16-25	2-8	
	1-2	Very gravelly fine sandy loam	GC	A-2-4	0-6	0-6	45-63	31-51	25-47	14-28	16-25	2-8	
	2-4	Extremely gravelly sandy loam	GW-GC	A-1-a	0-5	0-11	42-43	24-28	18-24	9-13	19-27	4-11	
	4-29	Very gravelly sandy loam	SC-SM	A-1-b	0-5	0-11	49-61	26-52	20-44	10-24	19-28	4-11	
	29-56	Extremely gravelly loamy coarse sand, gravelly sand	SP-SM	A-1-b	0	0-16	47-87	21-72	16-58	1-9	0-17	NP-2	
	56-60	Cemented material		---	---	---	---	---	---	---	---	---	
	60-69	Fine sand	SM	A-2-4	0	0	93-100	85-100	77-94	10-16	0-16	NP-2	
2100: Perurose-----													
	0-2	Gravel	SP-SM	A-1-a	0	0-20	49-61	3-16	3-15	1-5	15-19	1-3	
	2-3	Loamy fine sand	SM	A-2-4	0	0	93-100	73-98	69-96	22-33	15-18	1-2	
	3-7	Sand, gravelly fine sandy loam, fine sandy loam, loamy fine sand, loamy sand	SM	A-2-4	0	0-13	80-100	59-98	53-98	16-37	0-22	NP-6	
	7-18	Sand, gravelly fine sandy loam, fine sandy loam, loamy fine sand, loamy sand	SM	A-2-4	0	0-13	80-100	59-98	44-85	12-31	0-22	NP-6	
	18-30	Gravelly sand, sand	SM	A-2-4	0	0	86-100	72-98	56-82	11-20	0-17	NP-1	
	30-43	Cemented sand		A-1-a	0	0	92-100	85-100	66-82	11-18	0-17	NP-1	
	43-61	Loamy sand, gravelly coarse sand, gravelly sand, sand	SP-SM	A-1-b	0	0	93-100	59-92	46-76	5-13	0-17	NP-1	
Coxpin-----													
	0-2	Fine sandy loam	SM	A-2-4	0	0	92-100	77-93	69-89	30-43	17-23	3-7	
	2-10	Fine sandy loam, sand, loamy fine sand, gravelly sandy loam	SM	A-2-4	0	0	93-100	78-98	74-98	27-42	15-23	1-7	
	10-17	Sand, gravelly loamy sand, fine sandy loam, loamy fine sand, gravelly sandy loam	SM	A-1-b	0	0-6	80-92	54-85	40-68	11-23	0-19	NP-3	
	17-22	Cemented gravelly loamy sand, cemented sand	SM	A-2-4	0	0	87-100	56-98	43-80	7-17	0-16	NP-2	
	22-59	Fine sandy loam, gravelly sand, sand	SC-SM	A-2-4	0	0-6	80-100	60-98	49-90	19-40	0-20	NP-4	

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
2100: Pintobasin, gravelly surface-----	<u>In</u>					<u>Pct</u>	<u>Pct</u>					<u>Pct</u>		
	0-2	Loamy sand	SM	A-2-4	0	0	93-98	73-92	57-79	22-35	0-22	NP-6		
	2-14	Loamy sand, sand, gravelly loamy sand	SM	A-1-b, A-2-4	0	0	87-97	60-85	46-69	15-24	0-18	NP-3		
	14-35	Loamy fine sand, sand, gravelly sand	SM, SP-SM	A-2-4, A-1-b, A-3	0	0	87-100	60-97	46-80	5-14	0-18	NP-3		
2101: Perurose, rarely flooded-	35-59	Loamy fine sand, sand, gravelly sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0-2	87-100	60-97	46-80	8-17	0-18	NP-3		
Pintobasin, rarely flooded-	0-1	Sand	SP-SM	A-3	0	0	93-100	74-98	57-81	7-14	0-17	NP-1		
	1-5	Sand, gravelly fine sandy loam, fine sandy loam, loamy fine sand, loamy sand	SM	A-2-4	0	0-13	80-100	59-98	53-98	16-37	0-22	NP-6		
	5-16	Sand, gravelly fine sandy loam, fine sandy loam, loamy fine sand, loamy sand	SM	A-2-4	0	0-13	80-100	59-98	44-85	12-31	0-22	NP-6		
	16-28	Gravelly sand, sand	SM	A-2-4	0	0	86-100	72-98	56-82	11-20	0-17	NP-1		
	28-41	Cemented sand			0	0	92-100	85-100	66-82	11-18	0-17	NP-1		
	41-59	Loamy sand, gravelly coarse sand, gravelly sand, sand	SP-SM	A-1-b	0	0	93-100	59-92	46-76	5-13	0-17	NP-1		
Pintobasin, rarely flooded-	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0	92-100	79-92	61-76	7-14	0-20	NP-4		
	2-4	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SW-SM	A-2-4, A-1-b, A-3	0	0	86-100	59-85	46-69	7-13	0-18	NP-3		
	4-24	Gravelly coarse sand, gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	46-80	7-16	0-18	NP-3		
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	45-79	5-14	0-18	NP-3		

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
2110: Descent-----	In						Pct	Pct					Pct	
	0-2	Extremely channery loamy fine sand	GP-GM	A-1-a	0-14	24-51		3-24	0-21	0-20	0-7	0-20	NP-4	
	2-2	Channery loamy fine sand	SM	A-2-4	0-2	8-17		76-85	75-85	69-82	20-27	0-20	NP-4	
	2-7	Very channery fine sandy loam, extremely channery fine sandy loam	GP-GC	A-1-a	0-3	21-32		27-50	25-49	22-46	10-22	17-22	3-7	
	7-17	Very channery loamy sand, extremely channery loamy sand	GM	A-1-b	0-5	15-33		30-54	28-53	21-43	7-17	0-19	NP-4	
Descent, stable-	17-59	Very channery sand, extremely channery sand	GP	A-1-a	0-3	22-34		28-52	25-51	19-40	2-6	0-17	NP-2	
	0-0	Channers	GP-GC	A-2-4	0-14	25-51		3-23	0-20	0-18	0-11	18-23	4-7	
	0-1	Channery fine sandy loam	SC-SM	A-4	0-2	5-18		75-85	74-84	62-74	36-45	19-24	4-7	
	1-7	Very channery fine sandy loam, extremely channery fine sandy loam	GP-GC	A-1-a	0-3	21-32		27-50	25-49	22-46	10-22	17-22	3-7	
	7-17	Very channery loamy sand, extremely channery loamy sand	GM	A-1-b	0-5	15-33		30-54	28-53	21-43	7-17	0-19	NP-4	
2111: Descent, warm---	17-59	Very channery sand, extremely channery sand	GP	A-1-a	0-3	22-34		28-52	25-51	19-40	2-6	0-17	NP-2	
	0-2	Extremely channery loamy fine sand	GP-GM	A-1-a	0-14	24-51		3-24	0-21	0-20	0-7	0-20	NP-4	
	2-2	Channery loamy fine sand	SM	A-2-4	0-2	8-17		76-85	75-85	69-82	20-27	0-20	NP-4	
	2-7	Very channery fine sandy loam, extremely channery fine sandy loam	GP-GC	A-1-a	0-3	21-32		27-50	25-49	22-46	10-22	17-22	3-7	
Descent, warm---	7-17	Very channery loamy sand, extremely channery loamy sand	GM	A-1-b	0-5	15-33		30-54	28-53	21-43	7-17	0-19	NP-4	
	17-59	Very channery sand, extremely channery sand	GP	A-1-a	0-3	22-34		28-52	25-51	19-40	2-6	0-17	NP-2	



Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	in	Pct	4	10	40	200			
2120: Deprave-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
	0-1	Gravel											
	1-2	Gravelly loam	GP	A-2-4	0-5	6-35	24-28	0-6	0-6	0-4	22-28	7-11	
	2-13	Extremely gravelly	SC	A-4	0-7	0-21	72-76	50-61	42-54	29-39	22-28	7-11	
		coarse sandy loam,	SC	A-2-6	0-5	0-17	58-78	24-52	19-49	10-29	25-37	9-18	
		very gravelly sandy loam, very gravelly sandy clay loam											
	13-33	Very gravelly loamy	SP-SM	A-1-a	0-2	0-16	45-73	15-59	11-46	3-14	0-16	NP-1	
		coarse sand, extremely gravelly sandy loam,											
		very gravelly loamy sand, very gravelly sand											
	33-63	Very gravelly coarse sand, cemented, very gravelly sand, cemented	SP	A-1-a	0-2	0-17	54-71	28-57	21-45	2-6	0-14	NP	
Rizzo, frequently flooded-----	0-4	Gravelly coarse sand	SP	A-1-b									
	4-12	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-1	74-80	55-66	23-31	3-7	0-18	NP-3	
					0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3	
	12-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3	

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Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments				Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200	Pct			
	In				Pct	Pct								
2121: Rizzo, rubbly----														
	0-1	Very cobbly coarse sandy loam	SM											
	1-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM		6-14	13-29	76-83	37-66	22-45	11-26	16-25	2-9		
					0-12	0-26	61-81	8-73	4-40	1-15	0-18	NP-3		
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM		0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3		
2130: Goldenbell-----	19-59	Loamy sand, extremely gravelly coarse sand gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW		0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3		
	0-2	Gravel	GW		0-5	10-25	13-22	0-11	0-10	0-8	22-28	7-11		
	2-3	Loam	CL		0	0	92-95	76-88	65-81	50-64	22-28	7-11		
	3-11	Gravelly loam, very gravelly sandy loam, very gravelly loam	SC		0-2	0-18	61-85	38-69	32-63	23-48	25-32	9-14		
Descent-----	11-16	Cemented very gravelly loamy sand, cemented very gravelly sand	SP-SM		0-2	0-11	66-75	38-57	29-45	3-6	0-15	NP-1		
	16-59	Extremely gravelly sand	SP		0	0-5	58-63	20-31	16-25	1-3	0-14	NP		
	0-1	Loamy fine sand	SM		0	5-8	85-90	85-90	79-88	24-30	0-20	NP-4		
	1-7	Very channery fine sandy loam, extremely channery fine sandy loam	GP-GC		0-3	21-32	27-50	25-49	22-46	10-22	17-22	3-7		
	7-17	Very channery loamy sand, extremely channery loamy sand	GM		0-5	15-33	30-54	28-53	21-43	7-17	0-19	NP-4		
	17-59	Very channery sand, extremely channery sand	GP		0-3	22-34	28-52	25-51	19-40	2-6	0-17	NP-2		

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
2140: Rockhound, cobbly-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>		
	0-3	Extremely gravelly loam	GW		1-3	10-17	18-23	0-11	0-10	0-7	18-27		4-10	
	3-4	Gravelly silt loam	CL		0-2	0-7	71-86	50-76	42-71	34-58	19-27		4-10	
	4-34	Gravelly sandy loam, very gravelly loam	SC		0-3	0-18	78-91	42-77	31-62	14-31	22-29		7-12	
2402: Rizzo-----	34-59	Very gravelly sand, extremely gravelly loamy sand, very gravelly sandy loam	SP-SM	A-1-b, A-2-6	0-2	0-13	59-74	25-52	19-50	3-17	0-29		NP-13	
2402: Rizzo-----	0-2	Gravelly loamy coarse sand	SM	A-1-b	0-6	0-6	74-88	54-81	30-48	11-20	0-18		NP-3	
	2-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0-12	0-26	61-81	8-73	4-40	1-15	0-18		NP-3	
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18	0-18		NP-3	
	19-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17		NP-3	



Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200	Pct	Pct		
2402: Rizzo, frequently flooded-----	In				Pct	Pct						Pct		
	0-1	Extremely gravelly coarse sand	SW	A-1-a	5-12	12-21	55-65	18-41	8-19	1-4			0-18	NP-3
	1-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0-12	0-26	61-81	8-73	4-40	1-15			0-18	NP-3
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18			0-18	NP-3
	19-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9			0-17	NP-3
2403: Rizzo-----														
	0-1	Very gravelly fine sandy loam	SC-SM	A-2-4, A-1-b	0-6	0-18	58-79	27-57	23-52	12-30			17-25	3-9
	1-7	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0-12	0-26	61-81	8-73	4-40	1-15			0-18	NP-3
	7-20	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18			0-18	NP-3
	20-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9			0-17	NP-3

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
2403: Rizzo, occasionally flooded-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>		
	0-4	Gravelly coarse sand	SP	A-1-b	0	0-1	74-80	55-66	23-31	3-7	0-18	NP-3	
	4-12	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3	
	12-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3	
2404: Rizzo, occasionally flooded-----	0-2	Gravelly loamy coarse sand	SM	A-1-b	0-6	0-6	74-88	54-81	30-48	11-20	0-18	NP-3	
	2-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0-12	0-26	61-81	8-73	4-40	1-15	0-18	NP-3	
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3	
	19-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200	Pct	Pct		
	In				Pct	Pct								
2404: Rizzo, very rarely flooded-														
	0-1	Loamy fine sand	SM	A-2-4	0	0	92-97	84-90	79-88	28-34			0-17	NP-2
	1-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0-12	0-26	61-81	8-73	4-40	1-15			0-18	NP-3
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18			0-18	NP-3
	19-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9			0-17	NP-3
2405: Carrizo, rarely flooded-----														
	0-1	Gravelly loamy sand	SM	A-1-b	0-2	0-6	79-91	57-78	45-65	16-26			16-22	2-6
	1-5	Gravelly sand	SP-SM	A-1-b, A-2-4	0	0-6	78-92	56-77	37-55	8-16			0-20	NP-4
	5-59	Very gravelly sand	SP-SM	A-1-a, A-1-b	0	2-11	60-78	34-56	22-39	4-8			0-18	NP-3
Carrizo, occasionally flooded-----														
	0-1	Very gravelly loamy sand	SP-SM	A-1-b	0	0-6	48-71	29-52	22-42	6-14			0-20	NP-4
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sand, gravelly sand, gravelly sand	GP-GM	A-1-b	0	0-17	37-65	34-64	23-46	4-11			0-20	NP-4
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8			0-18	NP-3
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	SP-SM, GP	A-1-a	0	0-21	16-56	13-54	8-38	1-8			0-18	NP-3

1312

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
2407: Carrizo, occasionally flooded-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>		
	0-1	Very gravelly loamy sand	SP-SM	A-1-b	0	0-6	48-71	29-52	22-42	6-14	0-20	NP-4		
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sand, gravelly sand	GP-GM	A-1-b	0	0-17	37-65	34-64	23-46	4-11	0-20	NP-4		
	5-13	Very gravelly coarse sand, extremely gravelly sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3		
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	SP-SM, GP	A-1-a	0	0-21	16-56	13-54	8-38	1-8	0-18	NP-3		
	0-1	Sand	SM	A-2-4	0	0	88-97	77-92	51-66	12-19	0-18	NP-3		
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sand, gravelly sand	GP-GM	A-1-b	0	0-17	37-65	34-64	23-46	4-11	0-20	NP-4		
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3		
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	SP-SM, GP	A-1-a	0	0-21	16-56	13-54	8-38	1-8	0-18	NP-3		
Carrizo, frequently flooded-----	0-1	Sand	SM	A-2-4	0	0	88-97	77-92	51-66	12-19	0-18	NP-3		
	1-5	Extremely gravelly sand, very gravelly loamy sand, very gravelly sand, gravelly sand	GP-GM	A-1-b	0	0-17	37-65	34-64	23-46	4-11	0-20	NP-4		
	5-13	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GP-GM	A-1-a	0	0-17	36-46	33-43	22-30	4-8	0-18	NP-3		
	13-59	Very gravelly coarse sand, extremely gravelly sand, very gravelly sand, very gravelly loamy sand	SP-SM, GP	A-1-a	0	0-21	16-56	13-54	8-38	1-8	0-18	NP-3		

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
2408: Rizzo, frequently flooded-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>		
	0-4	Gravelly coarse sand	SP		0	0-1	74-80	55-66	23-31	3-7	0-18	NP-3		
	4-12	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b A-1-b	0 0	0-26 0-26	61-84 61-84	8-72 8-72	5-43 5-43	2-18 2-18	0-18 0-18	NP-3 NP-3		
	12-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3		
Rizzo, very rarely flooded-	0-2	Gravelly loamy coarse sand	SM	A-1-b	0-6	0-6	74-88	54-81	30-48	11-20	0-18	NP-3		
	2-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0-12	0-26	61-81	8-73	4-40	1-15	0-18	NP-3		
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3		
	19-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3		

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
2409: Rizzo, frequently flooded-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
	0-1	Gravelly loamy fine sand	SM	A-2-4	0	0-6	80-93	53-71	49-70	15-24	0-18	NP-3	
	1-4	Gravelly coarse sand	SP	A-1-b	0	0-1	74-80	55-66	23-31	3-7	0-18	NP-3	
	4-12	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3	
	12-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3	
Chemwash, frequently flooded-----	0-2	Very gravelly coarse sand	SW-SM	A-1-a, A-1-b	0	0	83-96	31-55	14-29	3-9	0-20	NP-4	
	2-67	Stratified extremely gravelly coarse sand to very gravelly loamy coarse sand	SP-SM, SW	A-1-a	0-5	0-11	79-87	25-56	11-28	2-7	0-20	NP-3	
Carsitas, occasionally flooded, braided-----	0-1	Gravelly loamy coarse sand	SP-SM, SM	A-2-4, A-1-b	0	0-4	86-93	64-78	36-48	13-20	0-19	NP-3	
	1-59	Coarse sand, loamy sand, gravelly loamy coarse sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-6	83-100	48-89	37-72	6-14	0-17	NP-2	
2420: Carsitas, frequently flooded-----	0-1	Gravelly sand	SP-SM	A-2-4, A-1-b	0	0-3	87-97	54-78	41-63	7-12	0-17	NP-2	
	1-59	Coarse sand, loamy sand, gravelly loamy coarse sand, gravelly sand	SP-SM	A-3, A-2-4, A-1-b	0	0-6	83-100	48-89	37-72	6-14	0-17	NP-2	



Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
2420: Carsitas, occasionally flooded-----	In													
	0-1	Gravelly sand	SP-SM	A-2-4, A-1-b	0	0-3	87-97	54-78	41-63	7-12	0-17	NP-2		
	1-59	Coarse sand, loamy sand, gravelly loamy coarse sand, gravelly sand	SP-SM	A-3, A-2-4, A-1-b	0	0-6	83-100	48-89	37-72	6-14	0-17	NP-2		
Carsitas, rarely flooded-														
	0-1	Sandy loam	SM	A-2-4	0	0-4	92-98	76-91	55-68	23-30	16-19	2-3		
	1-59	Coarse sand, loamy sand, gravelly loamy coarse sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-6	83-100	48-89	37-72	6-14	0-17	NP-2		
2421: Carsitas, very rarely flooded-														
	0-1	Gravelly loamy sand	SM	A-2-4, A-1-b	0	0-4	81-92	50-77	37-63	13-25	0-21	NP-4		
	1-59	Coarse sand, loamy sand, gravelly loamy coarse sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-6	83-100	48-89	37-72	6-14	0-17	NP-2		
Carsitas, rarely flooded-														
	0-1	Sandy loam	SM	A-2-4	0	0-4	92-98	76-91	55-68	23-30	16-19	2-3		
	1-59	Coarse sand, loamy sand, gravelly loamy coarse sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-6	83-100	48-89	37-72	6-14	0-17	NP-2		
2431: Chemwash, frequently flooded, braided-----														
	0-2	Very gravelly coarse sand	SW-SM	A-1-b	0	0	83-96	31-55	14-29	3-9	0-20	NP-4		
	2-67	Stratified extremely gravelly coarse sand to very gravelly loamy coarse sand	SP-SM, SW	A-1-a	0-5	0-11	79-87	25-56	11-28	2-7	0-20	NP-3		

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
2431: Chemwash, frequently flooded-----	In				Pct	Pct						Pct		
	0-2	Very gravelly coarse sand	SW-SM	A-1-b	0	0	83-96	31-55	14-29	3-9		0-20	NP-4	
	2-67	Stratified extremely gravelly coarse sand to very gravelly loamy coarse sand	SP-SM, SW	A-1-a	0-5	0-11	79-87	25-56	11-28	2-7		0-20	NP-3	
2440: Rizzo-----	0-1	Gravelly loamy fine sand	SM	A-2-4	0	0-6	80-93	53-71	49-70	15-24		0-18	NP-3	
	1-4	Gravelly coarse sand	SP	A-1-b	0	0-1	74-80	55-66	23-31	3-7		0-18	NP-3	
	4-12	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18		0-18	NP-3	
	12-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9		0-17	NP-3	
Rizzo, occasionally flooded-----	0-1	Extremely gravelly coarse sand	SW	A-1-a	5-12	12-21	55-65	18-41	8-19	1-4		0-18	NP-3	
	1-4	Gravelly coarse sand	SP	A-1-b	0	0-1	74-80	55-66	23-31	3-7		0-18	NP-3	
	4-12	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18		0-18	NP-3	
	12-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9		0-17	NP-3	

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
2440: Rizzo, extremely stony	In					Pct	Pct					Pct	
	0-1	Extremely cobbly sandy loam	SP-SM	A-1-a	6-11	13-28	58-77	16-40	11-33	5-16	16-24	2-9	
	1-9	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0-12	0-26	61-81	8-73	4-40	1-15	0-18	NP-3	
	9-19	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SM	A-1-b	0	0-26	61-84	8-72	5-43	2-18	0-18	NP-3	
	19-59	Loamy sand, extremely gravelly sand, very gravelly coarse sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	SW	A-1-a	0	0-26	61-82	8-69	4-34	1-9	0-17	NP-3	
	0-2	Fine sand	SM	A-2-4	0	0	99-100	91-100	85-95	11-14	0-14	NP	
	2-59	Fine sand	SM	A-2-4	0	0	99-100	91-100	85-95	11-14	0-14	NP	
	0-1	Fine sand	SP-SM	A-2-4	0	0-7	93-100	78-97	71-92	8-13	0-17	NP-2	
	1-6	Fine sand	SP-SM	A-2-4	0	0	98-100	92-100	84-95	9-14	0-17	NP-2	
	6-22	Fine sand	SP-SM	A-2-4	0	0-7	93-100	78-100	72-95	8-14	0-17	NP-2	
2715: Dalelake-----	22-29	Fine sand	SP-SM	A-2-4	0	0-7	93-100	78-100	72-95	8-14	0-17	NP-2	
	29-42	Very gravelly sand, extremely cobbly fine sand	SP-SM	A-1-b	0	0-41	69-87	24-70	22-66	2-10	0-16	NP-2	
	42-59	Fine sand	SP-SM	A-2-4	0	0	98-100	92-100	84-95	9-14	0-17	NP-2	
	0-1	Fine sand	SM	A-2-4	0	0	93-100	78-92	73-90	14-20	0-18	NP-3	
	1-8	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SM	A-2-4	0	0	93-100	78-92	73-90	12-18	0-18	NP-3	
	8-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	46-80	7-16	0-18	NP-3	
	24-59	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	45-79	5-14	0-18	NP-3	
	0-1	Fine sand	SM	A-2-4	0	0	93-100	78-92	73-90	14-20	0-18	NP-3	
	1-8	Loamy sand, gravelly loamy sand, fine sand, gravelly sand, sand	SM	A-2-4	0	0	93-100	78-92	73-90	12-18	0-18	NP-3	
	8-24	Gravelly coarse sand, gravelly loamy sand, loamy sand, sand, gravelly sand	SP-SM	A-3, A-2-4, A-1-b	0	0	93-100	60-98	46-80	7-16	0-18	NP-3	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
2716: Dalelake, steep-	<u>In</u>													
	0-4	Fine sand	SP-SM	A-2-4										
	4-59	Fine sand	SP-SM	A-2-4	0	0	0	99-100	91-100	85-95	11-14	0-14	NP	
					0	0	0	99-100	91-100	85-95	11-14	0-14	NP	
Dalelake-----	0-4	Fine sand	SP-SM	A-2-4	0	0	0	99-100	91-100	85-95	11-14	0-14	NP	
	4-59	Fine sand	SP-SM	A-2-4	0	0	0	99-100	91-100	85-95	11-14	0-14	NP	
2717: Dalelake-----	0-4	Fine sand	SP-SM	A-2-4	0	0	0	99-100	91-100	85-95	11-14	0-14	NP	
	4-59	Fine sand	SP-SM	A-2-4	0	0	0	99-100	91-100	85-95	11-14	0-14	NP	
Rock outcrop.														
Buzzardsprings, fine sand-----	0-2	Loamy fine sand	SM	A-4, A-2-4										
	2-3	Sandy loam, gravelly loamy sand, loamy sand, fine sand, sand	SM	A-2-4	0	0	0	92-97	84-95	79-92	31-38	0-18	NP-3	
					0	0	0	93-100	78-98	70-98	18-31	0-21	NP-6	
	3-8	Sand, gravelly loamy sand, sandy loam, loamy fine sand	SM	A-2-4	0	0	0	93-100	78-98	70-97	18-32	0-21	NP-6	
	8-23	Sand, sandy loam, loamy sand, gravelly loamy sand	SM	A-2-4	0	0	0	93-97	78-92	58-74	7-13	0-18	NP-3	
	23-60	Sand, gravelly sand, loamy sand	SP-SM	A-1-b	0	0-6	86-98	59-91	45-74	5-12	0-18	0-18	NP-3	
2718: Dalelake-----	0-4	Fine sand	SP-SM	A-2-4	0	0	0	99-100	91-100	85-95	11-14	0-14	NP	
	4-59	Fine sand	SP-SM	A-2-4	0	0	0	99-100	91-100	85-95	11-14	0-14	NP	
Sheephole, gravelly surface-----	0-1	Fine sand	SP-SM	A-2-4	0	0-7	93-100	78-97	71-92	8-13	0-17	NP-2		
	1-6	Fine sand	SP-SM	A-2-4	0	0	98-100	92-100	84-95	9-14	0-17	NP-2		
	6-22	Fine sand	SP-SM	A-2-4	0	0-7	93-100	78-100	72-95	8-14	0-17	NP-2		
	22-29	Fine sand	SP-SM	A-2-4	0	0-7	93-100	78-100	72-95	8-14	0-17	NP-2		
	29-42	Very gravelly sand, extremely cobbly fine sand	SP-SM	A-1-b	0	0-38	69-81	24-57	18-44	1-6	0-16	NP-2		
	42-59	Fine sand	SP-SM	A-2-4	0	0	98-100	92-100	84-95	9-14	0-17	NP-2		

Soil Survey of Joshua Tree National Park, California

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
	In		Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200	Pct		
2820: Rock outcrop.														
Impedimenta-----	0-1	Gravelly loamy sand	SM	A-1-b	0	0		86-90	64-77	49-61	15-20	0-18	NP-3	
	1-4	Gravelly sand, gravelly loamy sand	SP-SM	A-3, A-2-4	0	0-6		85-93	64-71	49-56	6-9	0-16	NP-1	
	4-14	Bedrock	---	---	---	---		---	---	---	---	---	---	
2825: Rock outcrop.														
Supplymine-----	0-6	Cobbles	SW	A-1-a	15-40	29-40		56-65	6-25	5-25	2-8	0-20	NP-4	
	6-7	Very cobbly loamy fine sand	SM	A-2-4	0-6	0-24		71-90	34-71	31-69	9-24	0-20	NP-4	
	7-20	Extremely gravelly fine sandy loam, extremely gravelly sandy loam, very cobbly fine sandy loam, very gravelly fine sandy loam	SC-SM	A-1-b	0-12	7-23		65-83	23-65	20-61	8-26	17-23	3-7	
	20-33	Extremely gravelly fine sandy loam, extremely gravelly sandy loam, very cobbly fine sandy loam, very gravelly fine sandy loam	SC-SM	A-2-4	0-11	7-22		66-84	24-67	19-60	9-33	20-30	5-10	
	33-43	Bedrock	---	---	---	---		---	---	---	---	---	---	
Bolero, dry-----	0-6	Cobbles	SP-SM	A-1-a	12-25	29-40		40-61	5-24	5-23	1-7	0-18	NP-3	
	6-7	Extremely gravelly loamy fine sand	SP-SM	A-1-b	0-11	17-27		50-64	21-36	19-34	6-11	0-18	NP-3	
	7-12	Extremely gravelly loamy fine sand, very gravelly loamy fine sand	SM	A-2-4	0	7-16		60-80	20-59	18-58	6-21	15-21	1-6	
	12-15	Extremely gravelly loamy fine sand, very gravelly loamy fine sand	SC-SM	A-1-b	0	7-33		67-79	25-58	22-55	7-19	15-21	1-6	
	15-19	Extremely gravelly loamy fine sand, gravel	GP	A-1-a	0-5	5-30		52-57	3-14	3-13	1-5	15-21	1-6	
	19-29	Bedrock	---	---	---	---		---	---	---	---	---	---	

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
2825: Ironage-----	In				Pct	Pct					Pct		
	0-6	Cobbles											
	6-9	Very gravelly fine sandy loam	SP	A-8	12-20	25-46	53-61	4-18	4-17	1-7	17-21	3-5	
			SC-SM	A-1-b	0-2	7-13	65-77	30-54	27-50	10-21	17-21	3-5	
	9-13	Extremely gravelly loam, very gravelly fine sandy loam	SC-SM	A-1-b	0-5	1-16	59-77	19-55	17-54	8-29	19-27	4-10	
	13-18	Extremely gravelly fine sandy loam, extremely gravelly loam, very gravelly fine sandy loam	SP-SC	A-2-4	0-5	1-16	59-76	19-52	16-50	7-25	19-27	4-10	
	18-24	Extremely gravelly sandy loam, extremely gravelly loam, very gravelly fine sandy loam	SP-SC	A-1-a	0	0-16	59-75	19-51	14-43	6-22	19-27	4-10	
	24-33	Bedrock	---	---	---	---	---	---	---	---	---	---	
2830: Rock outcrop.	0-8	Stones	GM	A-1-b	40-61	16-30	16-46	13-44	9-34	4-16	17-21	3-5	
	8-9	Very gravelly sandy loam	GP-GM	A-1-a	0	6-12	40-48	37-46	27-35	12-16	17-21	3-5	
	9-16	Extremely gravelly sandy loam, very gravelly sandy loam	GC	A-2-4, A-1-b, A-1-a	0-11	6-22	22-57	19-55	13-44	6-22	19-28	4-11	
	16-30	Bedrock	---	---	---	---	---	---	---	---	---	---	
2835: Rock outcrop.	0-5	Gravel	GP	A-1-a	1-20	25-40	8-21	4-18	4-17	2-8	17-23	3-7	
	5-7	Very gravelly fine sandy loam	SC-SM	A-1-b	0	6	70-79	34-49	31-46	12-20	19-23	4-7	
	7-17	Very gravelly fine sandy loam, extremely gravelly sandy loam, very gravelly sandy loam	GC-GM	A-2-4, A-1-b	0-11	1-22	22-53	18-51	16-50	8-26	19-28	4-11	
	17-27	Bedrock	---	---	---	---	---	---	---	---	---	---	

Soil Survey of Joshua Tree National Park, California

Table 18.-Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
2840: Rock outcrop.	In				Pct	Pct					Pct			
Jadestorm-----	0-2	Gravel												
	2-3	Very gravelly sandy loam	GP	A-1-a	0-17	12-31	8-23	4-19	3-16	1-8	17-23	17-23	3-7	
	2-3	Very gravelly sandy loam	SM	A-1-b, A-1-a	0-2	0-14	65-73	32-53	24-43	11-22	17-23	17-23	3-7	
	3-10	Extremely gravelly loam, very gravelly sandy loam	GP-GC	A-2-4	0-2	3-33	22-54	18-52	12-40	4-16	17-26	17-26	3-10	
	10-17	Bedrock												
	17-26	Bedrock												
			---	---	---	---	---	---	---	---	---	---	---	
			---	---	---	---	---	---	---	---	---	---	---	
3110: Coppermine, cool	0-1	Sandy loam												
	1-4	Gravelly sandy loam	SC-SM	A-2-4	0	0-4	92-97	76-91	55-72	23-33	17-24	17-24	3-7	
	4-8	Very gravelly sandy loam	SC-SM	A-2-4	0	0-1	79-92	52-77	36-60	16-29	15-23	15-23	1-7	
	8-11	Extremely gravelly sandy clay loam	GP-GC	A-2-6	0	0-1	58-73	28-52	20-41	11-25	22-30	22-30	7-13	
	11-20													
Stranger-----	0-1	Gravelly loamy fine sand	SC-SM	A-2-4	0	0-6	86-93	58-77	51-73	15-26	0-20	0-20	NP-4	
	1-3	Gravelly sand, gravelly loamy sand, sand, loamy sand	SP-SM	A-3	0	0	86-100	59-92	46-75	5-12	0-16	0-16	NP-2	
	3-13	Bedrock												
			---	---										
3120: Aguilareal-----	0-3	Stones												
	3-4	Extremely cobbly loamy sand	GW-GM SM	A-1-a A-1-b	20-25 5-11	15-20 29-34	50-54 61-63	23-32 41-52	18-26 33-44	5-9 14-19	15-20 15-21	15-21	1-4	
	4-14	Extremely gravelly sandy loam, very gravelly fine sandy loam, very gravelly sandy loam	SC-SM	A-1-b	0-11	0-28	70-85	26-72	19-61	9-32	18-29	18-29	4-11	
	14-19	Extremely gravelly sandy loam, extremely cobbly sandy loam, very gravelly sandy loam, very gravelly fine sandy loam	SC	A-2-4	0-16	13-27	53-85	17-66	13-54	6-30	18-29	18-29	4-11	
	19-29	Bedrock												
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Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
3120: Blackeagle-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>			
	0-5	Gravel	GP	A-1-a	1-20	25-40	8-21	4-18	4-17	2-8	17-23	3-7		
	5-7	Very gravelly fine sandy loam	SC-SM	A-1-b	0	6	70-79	34-49	31-46	12-20	19-23	4-7		
	7-17	Very gravelly fine sandy loam, extremely gravelly sandy loam, very gravelly sandy loam	GC-GM	A-2-4, A-1-b	0-11	1-22	22-53	18-51	16-50	8-26	19-28	4-11		
	17-27	Bedrock	---	---	---	---	---	---	---	---	---	---		
Rock outcrop. 3213: Dalvord-----	0-2	Gravel	GP	A-1-a	2-30	13-20	8-15	4-11	3-11	1-4	16-26	2-9		
	2-3	Gravelly loamy fine sand	SM	A-2-4	0	0-14	85-92	62-76	58-76	19-31	16-26	2-9		
	3-5	Fine sandy loam	SC-SM	A-2-4	0	0-1	94-97	77-91	70-89	28-40	19-26	4-9		
	5-14	Extremely gravelly sandy loam	GC	A-2-4	0	5-10	26-42	9-29	6-23	4-15	19-26	4-9		
	14-24	Bedrock	---	---	---	---	---	---	---	---	---	---		
Aguilareal-----	0-3	Stones	GW-GM	A-1-a	20-25	15-20	50-54	23-32	18-26	5-9	15-20	1-4		
	3-5	Gravelly loamy sand	SC-SM	A-2-4	0-6	0-6	74-83	55-75	43-62	13-21	15-20	1-4		
	5-14	Extremely gravelly sandy loam, very gravelly fine sandy loam, very gravelly loam, very gravelly sandy loam	SC-SM	A-1-b	0-11	0-28	70-85	26-72	19-61	9-32	19-28	4-11		
	14-19	Extremely gravelly sandy loam, extremely cobbly sandy loam, very gravelly sandy loam, very gravelly fine sandy loam	SC	A-2-4	0-16	13-27	53-85	17-66	13-54	6-30	19-28	4-11		
	19-29	Bedrock	---	---	---	---	---	---	---	---	---	---		
Rock outcrop. 3242: Langwell-----	0-1	Gravelly sandy loam	SC-SM	A-1-b	0	0	80-86	52-63	38-51	16-23	19-26	4-9		
	1-4	Sandy loam, gravelly sandy loam	SC-SM	A-1-b	0	0	85-95	52-80	38-63	15-28	19-26	4-9		
	4-14	Bedrock	---	---	---	---	---	---	---	---	---	---		

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>					<u>Pct</u>	<u>Pct</u>					<u>Pct</u>		
3242: Rock outcrop.														
Helendale, cool-	0-10	Loamy sand	SM	A-2-4	0	0	0	92-100	80-92	58-71	21-28	15-20	1-4	
	10-37	Loam, sandy loam	SC-SM	A-2-4	0	0	0	92-100	77-92	55-75	25-39	19-29	4-12	
	37-59	Sandy loam	SC	A-2-4	0	0	0	92-100	77-92	52-72	25-39	19-29	4-12	
3285: Pinecity-----														
	0-1	Gravelly loamy sand	SM	A-1-b	0	0	0	86-100	58-77	44-62	13-21	0-19	NP-4	
	1-7	Sand, loamy sand, gravelly loamy sand	SM	A-2-4	0	0	0	86-100	58-84	44-68	15-26	0-19	NP-4	
	7-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---	
Contactmine-----														
	0-1	Sandy loam	SC	A-2-6	0	0-11	0	91-98	77-95	50-73	19-35	17-29	3-12	
	1-5	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SC	A-2-6	0	0-6	0	65-95	44-88	28-66	11-31	18-29	3-12	
	5-9	Gravelly sandy clay loam, very gravelly sandy loam, loam, clay loam, sandy clay loam	SC	A-6	0	1-9	0	65-98	48-96	40-92	24-60	27-40	11-21	
	9-22	Stony sandy loam, paracobbly clay loam, gravelly loam, cobbly loam, gravelly sandy loam	CL	A-6	0-28	3-22	0	85-98	55-96	48-92	33-68	28-38	12-19	
	22-26	Gravelly sandy loam, gravelly loam, extremely gravelly loam	GP-GC	A-2-6	0	0-5	0	44-90	16-80	13-69	8-47	26-32	10-15	
	26-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---	
Desertqueen-----														
	0-4	Sandy loam	SM	A-2-4	0	0	0	95-98	78-92	58-72	26-34	17-22	3-6	
	4-11	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SC, SC-SM	A-1-b, A-2-6, A-2-4	0	0-7	0	80-94	47-85	35-71	17-38	20-29	6-12	
	11-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---	
Rock outcrop.														
3286: Pinecity, gravelly loamy sand-----														
	0-2	Gravelly loamy sand	SM	A-2-4, A-1-b	0	0-2	0	71-85	57-77	44-64	16-25	0-19	NP-4	
	2-4	Loamy sand, gravelly loamy sand	SM	A-2-4, A-1-b	0	0	0	79-100	58-92	45-75	16-30	0-19	NP-4	
	4-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
3291: Smithcanyon-----  Stubbespring-----  Rock outcrop.	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
	0-3 3-59	Gravelly loamy fine sand Bedrock	SM ---	A-2-4 ---	0 ---	0 ---	85-92 ---	71-84 ---	67-82 ---	24-31 ---	0-19 ---	NP-3 ---	
	0-1 1-4 4-13	Coarse sand Sandy loam, sand Loam, sandy loam, gravelly sandy loam	SW-SM SM SC	A-1-b A-2-4 A-2-4	0 0 0	0 0-1 0-4	96-99 95-97 95-100	86-93 85-89 72-95	39-44 67-79 51-76	10-12 13-23 29-47	0-18 15-27 19-28	NP-2 1-9 4-11	
	13-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
3292: Smithcanyon-----  Pinecity-----  Rock outcrop.	0-2 2-7	Gravelly loamy sand Sand, gravelly sand, gravelly loamy sand, loamy sand	SM SM	A-2-4 A-2-4	0 0	10-14 0-13	85-93 84-97	62-86 62-89	46-67 46-69	13-22 13-22	0-19 0-19	NP-3 NP-3	
	7-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
	0-2 2-7	Gravelly loamy sand Sand, gravelly sand, gravelly loamy sand, loamy sand	SM SM	A-1-b, A-2-4 A-1-b, A-2-4	0 0	0-2 0-6	81-97 78-100	51-81 55-97	38-67 42-80	12-24 13-29	0-21 0-21	NP-5 NP-5	
	7-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
3293: Smithcanyon-----  Pinecity-----  3294: Smithcanyon, dry	0-1 1-7	Gravelly sand Sand, gravelly sand, gravelly loamy sand, loamy sand	SP-SM SM	A-2-4, A-1-b A-1-b	0 0	3-13 0-6	85-92 86-97	53-81 58-89	41-66 44-71	7-14 13-23	0-19 0-19	NP-3 NP-3	
	7-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
	0-2 2-7	Gravelly loamy sand Sand, gravelly sand, gravelly loamy sand, loamy sand	SM SM	A-1-b, A-2-4 A-1-b, A-2-4	0 0	0-2 0-6	81-97 78-100	51-81 55-97	38-67 42-80	12-24 13-29	0-21 0-21	NP-5 NP-5	
	7-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
	0-1 1-9	Gravelly sand Sand, gravelly sand, gravelly loamy sand, loamy sand	SP-SM SM	A-3, A-2-4 A-2-4, A-1-b	0 0	0-2 0-4	84-94 84-97	57-79 57-89	44-64 43-71	7-13 13-23	0-19 0-19	NP-3 NP-3	
	9-59	Bedrock	---	---	---	---	---	---	---	---	---	---	

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
3295:													
Desertqueen, dry	0-4	Sandy loam	SM	A-2-4	0	0	95-98	78-92	58-72	26-34	17-22	3-6	
	4-11	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SC, SC-SM	A-1-b, A-2-6, A-2-4	0	0-7	80-94	47-85	35-71	17-38	20-29	6-12	
	11-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
Hexie-----													
	0-1	Very gravelly fine sandy loam	SC-SM	A-1-b	0-6	0-6	57-82	36-64	31-59	13-26	17-22	3-6	
	1-5	Gravelly sandy loam	SC-SM	A-2-4	0	0-7	84-91	68-83	49-63	22-30	17-21	3-6	
	5-9	Gravelly sandy loam, cobbly sandy loam, cobbly loam, sandy loam	SC	A-2-4	0-2	0-7	84-92	61-86	46-70	24-39	22-28	7-11	
	9-39	Sandy loam, loam, extremely paracobbly fine sandy loam	SC-SM	A-2-4	0	0-3	98-100	82-92	73-91	29-42	19-28	4-11	
	39-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
Rock outcrop.													
3296:													
Desertqueen-----	0-2	Cobbly sand	SM, SP-SM	A-2-4	3-7	7-14	91-95	73-86	57-69	10-14	0-16	NP-1	
	2-5	Cobbly loamy sand	SM	A-2-4	3-7	7-14	91-95	73-86	57-70	18-24	15-19	1-4	
	5-13	Cobbly sandy loam	SM, SC-SM	A-2-4	3-7	8-15	91-95	72-86	54-68	23-32	21-26	6-9	
	13-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
Pinecity-----													
	0-2	Sand	SP-SM	A-3	0	0	90-100	82-97	64-82	9-17	0-21	NP-5	
	2-6	Sand, loamy sand	SP-SM	A-2-4	0	0-15	92-100	84-97	64-80	9-17	0-19	NP-4	
	6-59	Bedrock			0	0	---	---	---	---	---	---	
3297:													
Desertqueen, warm-----													
	0-2	Sandy loam	SM	A-2-4	0	0	95-98	78-92	58-72	26-34	17-22	3-6	
	2-5	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SC, SC-SM	A-4, A-2-6, A-2-4	0	0-6	80-98	47-90	35-74	17-40	20-29	6-12	
	5-59	Bedrock	---	---	---	---	---	---	---	---	---	---	

Table 18.--Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
3297: Contactmine, dry	In												
	0-2	Gravelly sandy loam	SC-SM	A-2-4		0	0	85-92	63-76	46-64	21-34	17-29	3-12
	2-5	Very gravelly sandy loam, sandy loam, gravelly sandy loam	SC-SM	A-2-4		0	0-6	65-95	44-88	31-72	14-37	18-29	3-12
	5-12	Gravelly sandy clay loam, very gravelly sandy loam, loam, clay loam, sandy clay loam	CL	A-6		0	0-9	64-98	47-96	38-89	29-72	27-40	11-21
	12-22	Stony sandy loam, paracobbly clay loam, gravelly loam, cobbly loam, gravelly sandy loam	CL	A-6		0-28	0-21	85-98	55-96	44-87	33-68	28-38	12-19
	22-47	Paragravelly sandy loam	SC	A-4		0	0	100	100	71-81	41-51	19-28	4-12
	47-59	Bedrock											
	0-1	Gravelly sandy loam	SC-SM	A-2-4		0	0-7	71-92	50-77	38-66	18-36	19-29	4-12
	1-8	Extremely gravelly sandy loam, very gravelly sandy loam, gravelly sandy loam	SC-SM	A-2-4		0	0-5	43-91	17-79	13-68	6-37	19-29	4-12
3325: Ironped, warm---	8-15	Very paragravelly sandy loam, very gravelly sandy loam, gravelly sandy loam	SC-SM	A-4		0	0-12	37-91	25-87	19-74	12-50	19-29	4-12
	15-59	Bedrock											
	0-2	Gravelly sand	SP-SM	A-3, A-1-b		0	0-7	92-96	58-81	45-67	7-14	0-19	NP-4
	2-7	Sand, gravelly sand, gravelly loamy sand, loamy sand	SM, SP-SM	A-3		0	0-13	85-100	69-97	53-81	7-15	0-19	NP-4
Rock outcrop.	7-59	Bedrock											
Hexie-----	0-3	Gravelly sandy loam	SC-SM	A-1-b		3-7	1-7	83-91	66-83	48-63	22-30	17-22	3-6
	3-13	Gravelly sandy loam, cobbly sandy loam, cobbly loam, sandy loam	SC	A-2-4		1-3	3-21	85-95	55-86	42-70	21-39	22-28	7-11
	13-35	Gravelly sandy loam, loam, extremely parabouldery fine sandy loam	SC-SM	A-2-4		0	0-3	81-93	66-88	49-74	21-36	19-28	4-11
	35-59	Bedrock											

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	Pct	4	10	40		
3325: Ironped-----	In											Pct	
	0-2	Gravelly sand	SP-SM	A-3, A-1-b	0	0-7	92-96	58-81	45-67	7-14	0-19	NP-4	
	2-7	Sand, gravelly sand, gravelly loamy sand, loamy sand	SM, SP-SM	A-3	0	0-13	85-100	69-97	53-81	7-15	0-19	NP-4	
	7-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
3335: Xeric Torriorthents---	0-9	Gravelly loamy sand	SM	A-2-4	0	0	69-89	50-77	37-70	11-30	0-29	NP-11	
	9-26	Very gravelly sand, extremely cobbly loamy sand, extremely	SP-SM	A-2-4, A-1-a, A-1-b	0-5	0-63	66-77	13-59	10-51	3-21	0-24	NP-7	
	26-36	Very gravelly sand, extremely cobbly loamy sand, extremely	GW-GM	A-2-4, A-1-a	0-5	0-63	47-73	10-60	7-52	2-20	0-24	NP-7	
	36-50	Very gravelly sand, extremely cobbly loamy sand, extremely	SP-SM	A-2-4, A-1-a, A-1-b	0	0-6	83-86	36-59	28-53	5-15	0-24	NP-7	
Rock outcrop.	50-59	Bedrock	---	---	---	---	---	---	---	---	---	---	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
3335: Xeric Torriorthents, warm-----	<u>In</u>					<u>Pct</u>	<u>Pct</u>					<u>Pct</u>		
	0-9	Gravelly loamy sand	SM	A-2-4	0	0		69-89	50-77	37-70	11-30	0-29	NP-11	
	9-26	Very gravelly sand, extremely cobbly loamy sand, extremely	SP-SM	A-2-4, A-1-a, A-1-b	0-5	0-63		66-77	13-59	10-51	3-21	0-24	NP-7	
		gravelly loamy sand, very gravelly loamy												
		sand, gravelly sand												
		extremely cobbly loamy sand, extremely												
		gravelly loamy sand, very gravelly loamy												
		sand, gravelly sand												
26-36	Very gravelly sand, extremely cobbly loamy sand, extremely	GW-GM	A-2-4, A-1-a	0-5	0-63		47-73	10-60	7-52	2-20	0-24	NP-7		
	gravelly loamy sand, very gravelly loamy													
	sand, gravelly sand													
36-50	Very gravelly sand, extremely cobbly loamy sand, extremely	SP-SM	A-2-4, A-1-b	0	0-6		83-86	36-59	28-53	5-15	0-24	NP-7		
	gravelly loamy sand, very gravelly loamy													
	sand, gravelly sand													
50-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---		
3336: Xeric Torriorthents---														
	0-9	Gravelly loamy sand	SM	A-2-4	0	0		69-89	50-77	37-70	11-30	0-29	NP-11	
	9-26	Very gravelly sand, extremely cobbly loamy sand, extremely	SP-SM	A-2-4, A-1-a, A-1-b	0-5	0-63		66-77	13-59	10-51	3-21	0-24	NP-7	
		gravelly loamy sand, very gravelly loamy												
		sand, gravelly sand												
		extremely cobbly loamy sand, extremely												
	26-36	Very gravelly sand, extremely cobbly loamy sand, extremely	GW-GM	A-2-4, A-1-a	0-5	0-63		47-73	10-60	7-52	2-20	0-24	NP-7	
		gravelly loamy sand, very gravelly loamy												
		sand, gravelly sand												
		extremely cobbly loamy sand, extremely												
36-50	Very gravelly sand, extremely cobbly loamy sand, extremely	SP-SM	A-2-4, A-1-b	0	0-6		83-86	36-59	28-53	5-15	0-24	NP-7		
	gravelly loamy sand, very gravelly loamy													
	sand, gravelly sand													
50-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---		



Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>													
3336: Bigbernie-----														
	0-1	Gravelly loamy sand	SM	A-1-b	0-2	0-13	81-94	57-78	43-62	13-20	0-17	NP-2		
	1-4	Extremely gravelly sand, very gravelly loamy coarse sand, very gravelly fine sand, very gravelly loamy sand, very gravelly sand	SP-SM, SM	A-2-4, A-1-a, A-1-b	0-17	0-19	50-80	25-64	19-51	7-19	0-17	NP-2		
	4-24	Extremely gravelly coarse sand, very gravelly sand	SP-SM	A-2-4, A-1-a, A-1-b	2-12	3-21	58-92	23-71	17-57	3-11	0-16	NP-1		
	24-59	Bedrock	---	---	---	---	---	---	---	---	---	---		
3340: Seanna-----														
	0-1	Sandy loam	SM	A-2-4	0	0	93-98	77-93	58-77	27-40	17-26	3-9		
	1-6	Extremely gravelly sandy loam, very gravelly sandy loam, gravelly sandy loam	SC-SM	A-2-4	0	0-5	43-97	17-89	13-77	6-42	19-29	4-12		
	6-17	Very paragravelly sandy loam, very gravelly sandy loam, gravelly sandy loam	SC-SM	A-1-b	0	0-12	39-90	28-89	21-75	12-49	19-29	4-12		
	17-59	Bedrock	---	---	---	---	---	---	---	---	---	---		
Grubstake, moist	0-2	Gravel	GW	A-1-a	0-3	6-10	11-25	0-13	0-10	0-5	0-20	NP-4		
	2-3	Gravelly sandy loam	SM	A-2-4	0	0-14	78-90	56-75	40-57	17-26	10-20	1-4		
	3-18	Fine sandy loam, sandy loam	SC	A-2-4	0-13	0-6	76-97	46-84	33-67	16-36	19-26	4-9		
	18-30	Bedrock	---	---	---	---	---	---	---	---	---	---		
	30-39	Bedrock	---	---	---	---	---	---	---	---	---	---		
Pinecity-----	0-2	Gravelly loamy sand	SM	A-2-4	0-4	0	79-92	65-86	50-71	18-28	16-22	2-5		
	2-9	Loamy sand, gravelly loamy sand	SM	A-2-4	0	0-4	84-98	73-95	57-77	20-28	16-20	2-4		
	9-59	Bedrock	---	---	---	---	---	---	---	---	---	---		
3345: Bigcanyon-----														
	0-0	Sand	SP-SM	A-3	0	0	93-98	78-92	60-74	6-10	0-17	NP-2		
	0-14	Loamy sand, gravelly loamy sand, sand, coarse sand	SP, SP-SM	A-1-b	0	0	89-99	57-94	25-44	4-10	0-16	NP-1		
	14-20	Gravelly sand, loamy sand, parastony sand, sand	SP-SM	A-1-b, A-2-4, A-3	0	0	87-100	54-97	42-78	5-13	0-16	NP-1		
20-59	Bedrock	---	---	---	---	---	---	---	---	---	---			

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index		
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200					
	<u>In</u>						<u>Pct</u>						<u>Pct</u>			
3345: Bigcanyon, cool-	0-1	Sand	SM, SP-SM	A-2-4					0	93-98	78-92	61-76	11-16	0-17	NP-2	
	1-9	Gravelly fine sand, gravelly sand, sand	SM, SP-SM	A-2-4					0	87-99	55-92	43-75	8-16	0-16	NP-1	
	9-23	Gravelly fine sand, sand, gravelly sand	SM, SP-SM	A-2-4					0	87-99	55-92	43-74	7-15	0-16	NP-1	
	23-59	Bedrock	---	---					---	---	---	---	---	---	---	
3440: Pacific Mesa, steep-----																
	0-3	Gravelly sandy loam	SC-SM	A-2-4					0	7-13	76-92	60-83	46-65	29-42	17-20	3-4
	3-9	Very gravelly sandy loam	SC-SM	A-2-4					11-17	13-17	66-79	40-70	30-56	19-37	17-23	3-7
	9-16	Extremely stony sandy loam, extremely cobbly sandy loam	GM	A-1-b					11-39	19-35	56-60	29-50	23-40	15-27	17-21	3-6
	16-26	Bedrock	---	---					---	---	---	---	---	---	---	---
Pacific Mesa----	0-0	Silt loam	CL-ML	A-4					0	92-96	75-91	67-83	52-65	17-20	3-4	
	0-2	Silt loam	ML	A-4					0	92-97	76-91	69-84	53-66	17-20	3-4	
	2-9	Very gravelly sandy loam	SC-SM	A-2-4					11-17	13-17	66-79	40-70	30-56	19-37	17-23	3-7
	9-17	Extremely stony sandy loam, extremely cobbly sandy loam	GM	A-1-b					11-39	19-35	56-60	29-50	23-40	15-27	17-21	3-6
	17-26	Bedrock	---	---					---	---	---	---	---	---	---	---
3509: Cajon, very rarely flooded-																
	0-1	Sand	SP-SM	A-3					0	97-98	84-94	64-76	8-12	0-18	NP-3	
	1-19	Gravelly loamy sand, loamy sand	SM	A-2-4					0	86-100	64-92	49-73	17-27	0-17	NP-2	
	19-38	Gravelly loamy sand, gravelly loamy coarse sand	SP-SM	A-1-b					0	93-100	57-78	30-44	10-16	0-16	NP-1	
	38-59	Gravelly coarse sand, gravelly sand	SW	A-1-b					0	93-96	54-78	24-37	4-10	0-17	NP-2	
Friedliver-----																
	0-1	Very gravelly loamy sand	SP-SM	A-1-b					0	81-87	42-53	33-42	9-12	16-19	2-3	
	1-16	Loamy coarse sand, loamy sand, very gravelly loamy sand	SP-SM	A-1-b					0	93-97	48-89	37-70	12-22	16-18	2-3	
	16-33	Coarse sandy loam, gravelly sandy loam	SC-SM	A-2-4					0	85-97	63-81	49-67	32-45	21-26	6-9	
	33-59	Gravelly sandy clay loam, gravelly sandy loam	SC	A-2-6					0	92	58-77	42-63	21-34	23-31	8-13	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200				
	<u>In</u>					<u>Pct</u>	<u>Pct</u>					<u>Pct</u>			
3525: Cajon-----															
	0-1	Gravelly sand	SP-SM	A-1-b				0	0	66-79	54-71	40-58	4-10	0-19	NP-3
	1-4	Coarse sand, loamy coarse sand, loamy sand, gravelly sand	SP-SM	A-3, A-2-4				0	0	79-86	59-79	46-62	6-10	0-16	NP-1
	4-20	Coarse sand, gravelly sand, loamy sand, sand	SP-SM	A-1-b				0	0	72-92	54-85	41-67	4-9	0-16	NP-1
	20-59	Coarse sand, gravelly sand	SP-SM	A-1-b, A-3				0	0	73-92	54-85	41-67	4-9	0-16	NP-1
Friedliver-----															
	0-1	Gravelly sand	SP-SM	A-3, A-2-4				0	0	61-79	59-78	45-63	6-11	0-18	NP-3
	1-5	Gravelly coarse sand	SP-SM	A-1-b				0	0	67-79	65-78	29-39	5-11	0-20	NP-4
	5-16	Gravelly loamy sand, loamy sand, gravelly sand	SP-SM	A-3, A-2-4				0	0	67-86	65-85	50-70	6-12	0-20	NP-4
	16-32	Gravelly sandy loam, coarse sandy loam, sandy loam	SC-SM	A-2-4				0	0	71-92	70-92	54-75	26-38	21-26	6-9
3526: Cajon-----															
	32-39	Gravelly sandy loam, coarse sandy loam, sandy loam	SC-SM	A-2-4				0	0	78-92	70-92	51-71	22-33	21-26	6-9
	39-59	Coarse sandy loam, gravelly loamy sand	SM	A-2-4				0	0	72-92	65-90	51-76	16-27	17-23	3-7
	0-1	Gravelly loamy sand	SM	A-2-4				0	0	80-93	59-78	44-63	12-21	0-19	NP-3
	1-33	Gravelly loamy sand, loamy sand	SM	A-2-4				0	0	93-100	64-92	47-71	13-22	0-17	NP-2
Hypoint-----															
	33-61	Gravelly loamy sand, gravelly sand	SP	A-1-b				0	0	88-93	53-78	41-62	3-7	0-16	NP-1
	0-1	Loamy fine sand	SM	A-2-4				0	0	92-98	77-92	72-89	22-30	0-17	NP-2
	1-19	Sand	SM	A-2-4				0	0	93-98	78-92	61-76	12-17	0-17	NP-2
	19-59	Very gravelly sand	SP-SM	A-1-b				0	0-6	67-73	41-54	32-44	5-9	0-17	NP-2
Arizo, occasionally flooded-----															
	0-2	Gravelly coarse sand	SP-SM	A-1-b				0	0-6	80-86	63-73	28-32	5-6	0-14	NP
	2-10	Very gravelly coarse sand	SW-SM	A-1-b				0	0-6	81-87	42-55	19-24	3-5	0-14	NP
	10-59	Extremely gravelly coarse sand	SW	A-1-a				0	11-31	61-72	15-37	7-16	1-3	0-14	NP

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
In	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct		
3611: Burntshack, sand surface----	0-2	Coarse sand	SP-SM	A-1-b	0	0	0	94-100	80-93	37-44	10-13	0-16	NP-1	
	2-7	Sand	SM	A-2-4	0	0	0	92-97	85-94	65-72	18-20	15-16	1	
	7-12	Sand, loamy coarse sand, loamy sand	SM	A-2-4	0	0	0	92-100	85-95	64-73	17-21	0-16	NP-1	
	12-30	Coarse sand, loamy coarse sand	SM	A-1-b	0	0	0	93-97	80-87	41-46	13-15	16-18	2-3	
	30-39	Gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	0	85-100	70-97	52-77	22-36	19-25	4-9	
	39-59	Loamy coarse sand	SM	A-2-4	0	0	0	96-100	81-92	44-52	15-19	0-16	NP-1	
	0-2	Sand	SM	A-2-4	0	0	0	94-100	79-92	61-75	11-16	0-18	NP-3	
	2-7	Sand	SM	A-2-4	0	0	0	92-97	85-94	67-74	13-15	15-16	1	
	7-12	Sand, loamy coarse sand, loamy sand	SM	A-2-4	0	0	0	92-100	85-95	66-75	13-15	0-16	NP-1	
	12-30	Coarse sand, loamy coarse sand	SM	A-1-b	0	0	0	93-97	80-87	41-46	13-15	16-18	2-3	
3612: Burntshack-----	30-39	Gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	0	85-100	70-97	52-77	22-36	19-25	4-9	
	39-59	Loamy coarse sand	SM	A-2-4	0	0	0	96-100	81-92	44-52	15-19	0-16	NP-1	
	0-2	Sand	SM	A-2-4	0	0	0	94-100	79-92	61-75	11-16	0-18	NP-3	
	2-17	Sand, loamy coarse sand, loamy sand	SM	A-2-4	0	0	0	92-100	85-95	66-75	13-15	0-16	NP-1	
	17-27	Coarse sand, loamy coarse sand	SW-SM	A-1-b	0	0	0	93-97	80-87	40-44	10-12	16-18	2-3	
	27-59	Gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	0	85-100	70-97	52-77	22-36	19-25	4-9	
	0-2	Sand	SM	A-2-4	0	0	0	94-100	79-92	61-75	11-16	0-18	NP-3	
	2-17	Sand, loamy coarse sand, loamy sand	SM	A-2-4	0	0	0	92-100	85-95	66-75	13-15	0-16	NP-1	
	17-27	Coarse sand, loamy coarse sand	SW-SM	A-1-b	0	0	0	93-97	80-87	40-44	10-12	16-18	2-3	
	27-59	Gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	0	85-100	70-97	52-77	22-36	19-25	4-9	
Burntshack, occasionally flooded-----	0-2	Gravelly sand	SP-SM	A-1-b, A-2-4	0	0	0	73-85	59-78	46-63	8-14	0-18	NP-3	
	2-17	Sand, loamy coarse sand, loamy sand	SM	A-2-4	0	0	0	92-100	85-95	66-75	13-15	0-16	NP-1	
	17-27	Coarse sand, loamy coarse sand	SW-SM	A-1-b	0	0	0	93-97	80-87	40-44	10-12	16-18	2-3	
	27-59	Gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	0	85-100	70-97	52-77	22-36	19-25	4-9	
	0-0	Loamy sand	SM	A-2-4	0	0	0	100	79-92	60-73	18-24	0-19	NP-4	
	0-20	Sand, loamy sand	SM	A-2-4	0	0	0	100	79-92	61-76	22-31	0-19	NP-4	
	20-60	Loamy sand, sand, gravelly loamy sand	SM	A-2-4	0	0	0	100	78-92	59-76	21-30	0-19	NP-4	
	0-0	Loamy sand	SM	A-2-4	0	0	0	100	79-92	60-73	18-24	0-19	NP-4	
	0-20	Sand, loamy sand	SM	A-2-4	0	0	0	100	79-92	61-76	22-31	0-19	NP-4	
	20-60	Loamy sand, sand, gravelly loamy sand	SM	A-2-4	0	0	0	100	78-92	59-76	21-30	0-19	NP-4	
3676: Morongo, loamy sand, very rarely flooded-	0-0	Loamy sand	SM	A-2-4	0	0	0	100	79-92	60-73	18-24	0-19	NP-4	
	0-20	Sand, loamy sand	SM	A-2-4	0	0	0	100	79-92	61-76	22-31	0-19	NP-4	
	20-60	Loamy sand, sand, gravelly loamy sand	SM	A-2-4	0	0	0	100	78-92	59-76	21-30	0-19	NP-4	
	0-0	Loamy sand	SM	A-2-4	0	0	0	100	79-92	60-73	18-24	0-19	NP-4	
	0-20	Sand, loamy sand	SM	A-2-4	0	0	0	100	79-92	61-76	22-31	0-19	NP-4	
	20-60	Loamy sand, sand, gravelly loamy sand	SM	A-2-4	0	0	0	100	78-92	59-76	21-30	0-19	NP-4	
	0-0	Loamy sand	SM	A-2-4	0	0	0	100	79-92	60-73	18-24	0-19	NP-4	
	0-20	Sand, loamy sand	SM	A-2-4	0	0	0	100	79-92	61-76	22-31	0-19	NP-4	
	20-60	Loamy sand, sand, gravelly loamy sand	SM	A-2-4	0	0	0	100	78-92	59-76	21-30	0-19	NP-4	
	0-0	Loamy sand	SM	A-2-4	0	0	0	100	79-92	60-73	18-24	0-19	NP-4	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--						Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200	Pct	Pct		
3677: Morongo-----	In				Pct	Pct								
	0-1	Sand	SP-SM	A-3	0	0	85-100	79-98	61-80	7-13			0-18	NP-3
	1-6	Gravelly loamy sand, loamy sand, sand	SP-SM	A-3	0	0	93-100	71-95	55-79	6-14			0-19	NP-4
	6-28	Sand, fine sand, loamy sand, gravelly sand	SP-SM	A-3	0	0	86-98	65-95	50-79	5-14			0-19	NP-4
	28-59	Sand, coarse sand, loamy sand, gravelly sand	SP-SM	A-3, A-1-b	0	0	73-100	60-98	46-79	5-12			0-17	NP-2
3679: Morongo, cool----														
	0-2	Sand	SP-SM, SM	A-3, A-2-4	0	0	93-100	78-97	59-79	5-14			0-20	NP-4
	2-6	Sand, gravelly loamy sand, gravelly sand, loamy sand	SP-SM, SM	A-3, A-2-4	0	0	93-100	73-96	56-79	7-14			0-19	NP-4
	6-19	Loamy sand, gravelly loamy sand, sand, gravelly sand	SM	A-2-4	0	0	93-100	72-95	55-78	16-27			0-19	NP-4
	19-59	Loamy sand, coarse sand, sand, gravelly sand	SM	A-2-4	0	0	86-100	59-98	44-80	13-28			0-19	NP-4
Jumbo-rox-----	0-1	Sand	SM	A-2-4	0	0	94-100	79-98	61-78	9-15			0-17	NP-2
	1-4	Gravelly loamy sand, sand, loamy sand	SM	A-1-b, A-2-4	0	0	93-100	65-98	48-81	14-29			0-22	NP-6
	4-14	Gravelly sandy loam, gravelly loamy sand, sandy loam, loamy sand	SC-SM, SM, SC	A-1-b, A-2-4	0	0	93-100	64-98	45-82	18-39			17-29	3-12
	14-22	Gravelly sandy loam, gravelly loamy sand, sandy loam, loamy sand	SC-SM, SC, SM	A-1-b, A-2-4	0	0	93-100	64-98	45-81	18-40			17-29	3-12
	22-37	Gravelly loamy sand, loamy sand, gravelly sandy loam, sandy loam	SM, SC	A-2-4	0	0	93-100	65-98	52-90	15-35			17-29	3-12
	37-71	Gravelly loamy sand, loamy sand, loamy coarse sand	SM	A-1-b, A-2-4	0	0-4	86-100	59-98	44-79	12-25			0-19	NP-4

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
3680: Morongo-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
	0-1	Loamy sand	SM	A-2-4	0	0	93-100	73-98	55-79	12-22	0-19	NP-3	
	1-2	Loamy coarse sand, loamy sand, sand	SM	A-3, A-2-4	0	0	87-100	74-98	55-78	9-15	0-17	NP-2	
	2-35	Coarse sand, gravelly coarse sand, loamy coarse sand, gravelly loamy coarse sand, loamy sand, sand, gravelly loamy sand, gravelly sand	SP-SM	A-3	0	0	73-100	60-98	45-76	5-10	0-14	NP	
	35-59	Gravelly sand, gravelly loamy sand, sand, loamy sand, gravelly loamy coarse sand, coarse sand, gravelly coarse sand	SP-SM	A-1-b	0	0	80-100	61-93	26-41	4-8	0-14	NP	
3681: Morongo, very rarely flooded-	0-1	Sand	SP-SM	A-3	0	0	85-100	79-98	61-80	7-13	0-18	NP-3	
	1-6	Gravelly loamy sand, loamy sand, sand	SP-SM	A-3	0	0	93-100	71-95	55-79	6-14	0-19	NP-4	
	6-28	Sand, fine sand, loamy sand, gravelly sand	SP-SM	A-3	0	0	86-98	65-95	50-79	5-14	0-19	NP-4	
	28-59	Sand, coarse sand, loamy sand, gravelly sand	SP-SM	A-3, A-1-b	0	0	73-100	60-98	46-79	5-12	0-17	NP-2	
Jumborox, dry----	0-1	Sand	SM	A-2-4	0	0	94-100	79-98	61-78	9-15	0-17	NP-2	
	1-4	Gravelly loamy sand, sand, loamy sand	SM	A-1-b, A-2-4	0	0	93-100	65-98	48-81	14-29	0-22	NP-6	
	4-14	Gravelly sandy loam, gravelly loamy sand, sandy loam, loamy sand	SC-SM, SC	A-1-b, A-2-4	0	0	93-100	64-98	45-82	18-39	17-29	3-12	
	14-22	Gravelly sandy loam, gravelly loamy sand, sandy loam, loamy sand	SC, SC-SM	A-1-b, A-2-4	0	0	93-100	64-98	45-81	18-40	17-29	3-12	
	22-37	Gravelly loamy sand, loamy sand, gravelly sandy loam, sandy loam	SM, SC	A-2-4	0	0	93-100	65-98	52-90	15-35	17-29	3-12	
	37-71	Gravelly loamy sand, loamy sand, loamy coarse sand	SM	A-1-b, A-2-4	0	0-4	86-100	59-98	44-79	12-25	0-19	NP-4	

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>					<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
3682: Morongo, cool----	0-2	Sand	SP-SM, SM	A-3, A-2-4										
	2-6	Sand, gravelly loamy sand, gravelly sand, loamy sand	SP-SM, SM	A-3, A-2-4	0	0	0	93-100	78-97	59-79	5-14	0-20	NP-4	
	6-19	Loamy sand, gravelly loamy sand, sand, gravelly sand	SM	A-2-4	0	0	0	93-100	73-96	56-79	7-14	0-19	NP-4	
	19-59	Loamy sand, coarse sand, sand, gravelly sand	SM	A-2-4	0	0	0	86-100	59-98	44-80	13-28	0-19	NP-4	
Jumborox-----	0-2	Loamy sand	SC, SM	A-2-4										
	2-8	Sand, loamy sand, gravelly loamy sand	SC, SM	A-1-b, A-2-4	0	0	0	93-99	78-97	59-81	19-31	0-22	NP-6	
	8-21	Loamy sand, sandy loam, gravelly loamy sand, gravelly sandy loam	SC-SM, SM	A-1-b, A-2-4	0	0	0	89-100	62-95	46-78	15-30	0-22	NP-6	
	21-33	Gravelly loamy sand, loamy sand, gravelly sandy loam, sandy loam	SC, SC-SM	A-1-b, A-2-4	0	0	0	93-100	64-98	43-78	15-34	17-29	3-12	
	33-59	Sand, gravelly sand, gravelly coarse sand, loamy sand, loamy coarse sand, gravelly loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0	0	87-98	60-97	46-81	8-18	0-19	NP-4	
Urban land.														
3683: Morongo-----	0-1	Loamy sand	SM	A-2-4										
	1-59	Gravelly sand, sand, gravelly coarse sand	SW-SM	A-1-b	0	0	0	94-100	75-89	56-69	16-22	0-17	NP-2	
Bluecut, very rarely flooded-	0-1	Sandy loam	SC-SM, SM	A-2-4										
	1-12	Gravelly sandy clay loam	SC	A-2-6	0	0	0	87-98	76-91	56-73	25-35	15-22	1-6	
	12-26	Gravelly sandy loam, gravelly coarse sandy loam	SC-SM, SM, SC	A-2-4	0	0	0	79-84	65-76	56-67	28-35	30-35	13-17	
								0	81-86	56-70	28-42	12-23	15-25	
													1-9	
	26-33	Gravelly sand, gravelly loamy sand	SM	A-2-4	0	0	0	80-86	61-71	45-55	13-17	0-17	NP-2	
	33-59	Gravelly sand	SM	A-1-b	0	0	0	80-86	61-78	46-60	13-17	0-14	NP	



Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
3684: Morongo, warm----	In				Pct	Pct						Pct	
	0-1	Loamy sand	SM	A-2-4	0	0	97-98	82-85	60-68	17-22	0-19	NP-4	
	1-5	Gravelly loamy sand	SM	A-2-4	0	0	86-93	64-77	48-62	14-21	0-19	NP-4	
	5-16	Gravelly sand	SP-SM	A-3	0	0	93-97	59-79	45-65	5-11	0-19	NP-4	
16-79	Gravelly coarse sand	SP-SM	A-1-b	0	0	93-97	59-79	26-39	4-11	0-19	NP-4		
3685: Morongo, cool----													
	0-2	Sand	SP-SM	A-3	0	0	93-100	74-97	55-79	5-14	0-20	NP-4	
	2-6	Sand, gravelly loamy sand, gravelly sand, loamy sand	SM, SP-SM	A-2-4, A-3	0	0	93-100	73-96	56-79	6-14	0-19	NP-4	
	6-19	Loamy sand, gravelly loamy sand, sand, gravelly sand	SM	A-2-4	0	0	93-100	72-95	55-78	16-27	0-19	NP-4	
	19-59	Loamy sand, coarse sand, sand, gravelly sand	SM	A-2-4	0	0	86-100	59-98	44-80	13-28	0-19	NP-4	
Desertqueen, undulating-----													
	0-3	Loamy sand	SM	A-2-4	0	0	96-98	78-94	61-77	22-31	15-20	1-4	
	3-12	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SC-SM, SC	A-2-6, A-2-4	0	0-6	80-95	47-85	33-67	15-35	20-29	6-12	
	12-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
3690: Nasagold-----													
	0-1	Gravelly loamy sand	SM	A-2-4	0	0	93-100	53-77	41-64	12-23	15-22	1-6	
	1-6	Gravelly sandy loam, sandy loam	SC, SC-SM	A-1-b, A-2-4	0	0	93-100	57-91	38-67	12-26	15-21	1-6	
	6-20	Gravelly sandy loam, sandy loam	SC, SC-SM	A-1, A-2-4	0	0	92-100	57-95	38-72	12-30	16-26	2-10	
	20-37	Gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	95-100	73-91	49-71	19-33	16-26	2-10	
37-59	Loamy sand, gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	85-100	70-92	48-72	17-32	16-26	2-10		

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>		
3695: Gocougs-----														
	0-2	Loamy coarse sand	SM	A-2-4			0	0	97-100	85-97	49-60	21-27	0-18	NP-3
	2-6	Loamy sand, sandy loam, sand	SP-SM	A-2-4			0	0	99-100	79-91	62-81	12-23	15-25	1-9
	6-33	Gravelly coarse sandy loam, loam, gravelly sandy loam, gravelly loam, clay loam, sandy loam	SC	A-6, A-4			0	0	93-100	57-97	44-90	28-64	24-39	9-20
	33-46	Cemented sandy loam, cemented loamy sand, cemented gravelly sandy loam	SC-SM	A-2-4			0	0	92-98	69-91	48-70	21-34	18-25	4-8
4031: Crosgrain-----	46-65	Sand, gravelly coarse sand	SW-SM	A-1-b			0	0	93-98	59-88	27-40	6-10	0-14	NP
	0-1	Gravelly sandy loam	SC-SM	A-1-b			0	0-7	57-64	55-63	40-51	17-24	19-26	4-9
	1-6	Very gravelly sandy loam	SC-SM, GC-GM	A-2-4, A-1-b			0	9-19	47-59	45-57	33-47	15-23	20-28	6-12
	6-13	Very gravelly sandy loam	GC-GM	A-1-a			0	8-12	35-51	32-49	24-39	12-20	19-23	4-7
Crackerjack-----	13-22	Cemented material	---	---			---	---	---	---	---	---	---	---
	0-1	Gravelly sandy loam	SC-SM	A-1-b, A-2-4			0	0-6	53-71	51-69	38-57	19-31	19-26	4-9
	1-7	Gravelly loam	GC-GM	A-4			0	0-7	57-77	55-76	47-70	33-51	19-26	4-9
	7-13	Gravelly sandy loam	GC-GM	A-2-4			0	0-6	57-65	55-63	43-52	28-35	21-26	6-9
Pinkcan, dry----	13-59	Cemented very gravelly sandy loam	SC-SM	A-1-b			13-19	0-1	77-84	39-60	30-48	15-25	19-23	4-7
	0-0	Sandy loam	SC-SM	A-2-4			0	0-7	86-100	76-98	58-83	28-44	21-29	6-11
	0-11	Loam, gravelly loam, sandy loam, clay loam	SC	A-2-6			0	0-21	85-98	62-95	44-82	20-44	25-40	9-21
	11-19	Gravelly sandy clay loam, very gravelly sandy clay loam, sandy clay loam	SC	A-6			0	0-19	73-98	39-95	32-89	16-49	29-40	13-21
19-25														
	19-25	Gravelly loam, very cobbly sandy clay loam, gravelly sandy clay loam, loam	CL	A-6			0	0-19	79-98	44-95	35-86	23-59	25-35	9-17
	25-28	Sandy loam	SC	A-2-4			0	0-7	86-98	58-86	40-66	17-32	19-25	4-9
	28-33	Gravelly sandy loam	SC-SM	A-1-b			0	0-7	86-94	58-78	42-63	18-30	19-25	4-9
33-47	33-47	Loamy sand, gravelly sandy loam	SC-SM	A-2-4			0	0-7	86-96	58-84	41-66	19-33	19-25	4-9
	47-60	Cemented very gravelly loamy sand, cemented loamy sand, cemented gravelly sandy loam	SM	A-2-4			0	0-6	75-98	43-85	33-72	12-30	15-22	1-7

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200				
	<u>In</u>					<u>Pct</u>	<u>Pct</u>					<u>Pct</u>			
4041: Silvermine-----															
	0-1	Loamy sand	SC-SM	A-2-4				0	0	94-100	73-86	57-70	17-24	17-21	3-6
	1-7	Gravelly loamy sand	SC-SM	A-2-4				0	0	76-86	66-78	50-63	14-21	0-19	NP-4
	7-55	Cemented gravelly loamy sand	SM	A-2-4				0	0	86-97	65-82	49-64	16-22	0-18	NP-3
	55-59	Loamy sand, gravelly loamy sand	SM	A-2-4				0	0	61-93	59-92	45-75	12-24	0-19	NP-4
Helendale-----															
	0-2	Sandy loam	SC-SM	A-2-4				0	0	92-100	84-97	61-78	31-42	19-26	4-10
	2-16	Sandy loam	SC	A-4, A-2-4				0	0	92-98	77-97	53-76	30-47	19-29	4-12
	16-59	Gravelly sand	SP-SM	A-3				0	0	80-93	60-78	46-63	5-9	0-16	NP-1
Burntshack, very rarely flooded-----															
	0-2	Sand	SM	A-2-4				0	0	94-100	79-92	62-75	12-17	0-18	NP-3
	2-31	Sand, loamy coarse sand, loamy sand	SM	A-2-4				0	0	92-100	85-95	64-73	17-21	0-16	NP-1
	31-43	Gravelly sandy loam, sandy loam	SC-SM	A-2-4				0	0	92-100	77-96	57-78	25-37	19-25	4-9
	43-51	Sandy loam	SC-SM	A-2-4				0	0	95-100	80-91	50-67	12-22	0-23	NP-7
4064: Gravesumit-----															
	0-1	Loamy fine sand	SM	A-2-4				0	0	92-97	77-92	73-89	25-31	15-18	1-3
	1-7	Fine sandy loam, loamy fine sand	SM	A-2-4				0	0	93-98	78-92	71-91	26-38	0-21	NP-6
	7-13	Gravelly sandy loam, fine sandy loam	SC-SM	A-2-4				0	0	86-100	58-95	51-93	20-42	19-29	4-12
	13-29	Gravelly sandy loam, fine sandy loam	SC-SM	A-2-4				0	0	86-100	58-95	51-93	18-39	19-29	4-12
Helendale, sandy surface--															
	29-41	Very gravelly loamy coarse sand, very gravelly coarse sand	SW	A-1-a				0	0	84-100	42-55	18-26	3-6	0-17	NP-2
	41-45	Gravelly coarse sandy loam, sandy loam	SC	A-2-4				0	0	86-100	58-95	40-75	15-35	19-29	4-12
	45-60	Gravelly coarse sand	SW-SM	A-1-b				0	0	93-100	55-79	24-39	4-10	0-19	NP-4
4071: Helendale-----															
	0-10	Loamy sand	SM	A-2-4				0	0	92-100	80-92	58-71	21-28	15-20	1-4
	10-37	Loam, sandy loam	SC-SM	A-2-4				0	0	92-100	77-92	55-75	25-39	19-29	4-12
	37-59	Sandy loam	SC	A-2-4				0	0	92-100	77-92	52-72	25-39	19-29	4-12
Helendale-----															
	0-4	Sandy loam	SC-SM	A-4				0	0	92-100	79-91	61-74	37-47	19-24	4-7
	4-37	Loam, sandy loam	SC-SM	A-2-4				0	0	92-100	77-92	55-75	25-39	19-29	4-12
	37-59	Sandy loam	SC	A-2-4				0	0	92-100	77-92	52-72	25-39	19-29	4-12

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
4071: Desertqueen, very rarely flooded-----	In				Pct	Pct						Pct		
	0-2	Sandy loam	SM	A-2-4	0	0	95-98	78-92	58-72	26-34	17-22	3-6		
	2-5	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SC-SM, SC	A-2-6, A-2-4	0	0-6	80-95	47-85	33-67	15-35	20-29	6-12		
	5-12	Gravelly sandy loam, very gravelly sandy loam, coarse sandy loam	SC-SM, SC	A-2-4, A-2-6	0	0-13	77-95	55-86	29-53	16-31	20-29	6-12		
	12-14	Extremely gravelly loamy coarse sand	SP-SC, SW	A-1-a	0	0	84-100	10-30	5-16	2-6	17-19	3-4		
	14-59	Bedrock	---	---	---	---	---	---	---	---	---	---		
4091: Littlefargo-----														
	0-1	Loamy sand	SM	A-2-4	0	0	98	91-92	70-74	23-26	0-18	NP-3		
	1-4	Sandy loam	SM	A-2-4	0	0	97-98	87-92	65-74	29-36	15-21	1-6		
	4-31	Coarse sandy loam, sandy loam	SC-SM	A-2-4	0	0	100	90-92	68-78	32-41	19-29	4-12		
	31-34	Loamy sand, sandy loam	SM	A-2-4	0	0	98-100	83-86	62-69	28-34	17-23	3-7		
	34-59	Bedrock	---	---	---	---	---	---	---	---	---	---		
4245: Bluecut-----														
	0-4	Loamy sand	SM	A-2-4	0	0	97-100	85-98	65-81	21-29	0-20	NP-4		
	4-11	Loamy coarse sand, sandy loam, loamy sand	SM	A-1-b	0	0	97-100	85-95	44-58	15-25	0-23	NP-7		
	11-21	Sandy clay loam	SC	A-2-6	0	0	97-100	78-93	65-85	30-44	30-38	13-19		
	21-26	Gravelly sandy loam, very gravelly sandy loam, sandy loam	SC-SM	A-2-4	0	0	86-97	52-93	36-75	14-36	0-25	NP-9		
	26-49	Very gravelly loamy coarse sand, gravelly loamy sand, loamy sand	SW-SM	A-1-b	0	0	87-97	54-94	28-59	9-27	0-25	NP-9		
	49-79	Sandy loam, gravelly loamy sand, loamy coarse sand	SM	A-1-b	0	0	89-98	71-88	39-57	13-25	0-23	NP-7		
Morongo, very rarely flooded-														
	0-1	Sand	SP-SM	A-3, A-2-4	0	0	85-100	79-98	61-80	7-13	0-18	NP-3		
	1-6	Gravelly loamy sand, loamy sand, sand	SP-SM	A-3, A-2-4	0	0	93-100	71-95	55-79	6-14	0-19	NP-4		
	6-28	Sand, fine sand, loamy sand, gravelly sand	SP-SM	A-3, A-2-4	0	0	86-98	65-95	50-79	5-14	0-19	NP-4		
	28-59	Sand, coarse sand, loamy sand, gravelly sand	SP-SM	A-3, A-2-4, A-1-b	0	0	73-100	60-98	46-79	5-12	0-17	NP-2		

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200	Pct	Pct		
4245: Yander, very rarely flooded-	In				Pct	Pct								
	0-2	Loamy sand												
	2-23	Gravelly loamy sand, gravelly sand, sand	SM	A-2-4	0	0	98	83-92	64-72	23-26			0-16	NP-1
			SM	A-2-4	0	0-1	96-100	68-92	53-73	20-27			15-17	1-2
	23-40	Gravelly coarse sand, gravelly sand, sand	SW-SM	A-1-b	0	0-1	94-100	74-93	34-47	9-16			0-18	NP-3
4260: Minhoyt-----	40-79	Bedrock	---	---	---	---	---	---	---	---			---	---
	0-1	Sandy loam	SC-SM	A-4	0	0	93-100	72-98	54-78	34-51			20-26	5-9
	1-2	Loamy sand, gravelly sandy loam, gravelly loamy coarse sand, sandy loam	SM	A-1-b	0	0	85-95	52-79	30-55	13-29			0-24	NP-8
	2-12	Cemented coarse sand, cemented sand, cemented loamy coarse sand	SM	A-2-4	0	0	99-100	93-98	50-56	19-24			0-14	NP
	12-59	Cemented material	---	---	---	---	---	---	---	---			---	---
Corbilt, rarely flooded-----	0-6	Sand	SP-SM	A-3	0	0	92-98	83-97	64-77	5-9			0-16	NP-1
	6-14	Gravelly loamy sand, loamy sand, sand	SP-SM	A-3	0	0	93-98	71-92	54-75	5-12			0-19	NP-3
	14-51	Sandy loam	SC-SM	A-2-4	0	0	92-97	77-92	56-73	26-37			18-23	3-7
	51-59	Cemented loamy sand	SM	A-2-4	0	0	92-97	85-94	63-73	18-24			0-17	NP-1
4265: Werewolf, warm--	0-2	Gravelly sandy loam	SC-SM	A-2-4	0-2	0-7	77-92	54-74	39-59	23-36			18-25	3-9
	2-19	Very gravelly sandy loam	SC	A-2-6	0	0-6	74-79	48-57	33-44	18-26			20-28	6-12
	19-24	Extremely gravelly sandy loam, very gravelly sandy loam	GW-GC	A-2-4	0-5	2-11	51-78	28-57	21-44	11-23			24-26	9-10
	24-30	Gravelly sandy loam, extremely gravelly sandy loam, very gravelly sandy loam	SP-SC	A-1-a	0-6	0-6	66-79	31-58	23-44	10-20			19-21	4-6
	30-59	Very gravelly loamy sand, very gravelly sandy loam	SM	A-1-b	0-6	2-6	68-79	35-52	28-42	9-13			18-19	3-4

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification	Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
				Unified	AASHTO	>10 in	3-10 in	4	10	40	200		
4270: Yuccabutte, extremely cobbley sandy loam-----	In					Pct	Pct					Pct	
	0-2	Very gravelly loam	SC	A-2-4	0-13	6-12	68-83	35-59	30-55	20-38	22-31	7-13	
	2-16	Extremely cobbly sandy loam, extremely stony sandy clay loam, gravelly clay loam, extremely stony clay loam, gravelly loam	SC	A-2-6	0-32	7-26	56-84	12-67	10-64	8-54	27-40	12-21	
	16-30	Extremely stony sandy clay loam, extremely cobbley sandy loam, gravelly loam	SC	A-2-6	0-34	7-26	51-84	11-68	9-62	5-41	27-40	12-21	
4271: Yuccabutte, warm	0-0	Loam	CL	A-6	0	0	92-96	83-91	71-85	55-66	28-36	12-17	
	0-6	Gravelly clay loam, gravelly loam, extremely stony clay loam	CL	A-7-6	0-6	0-6	57-84	35-68	29-66	24-56	29-44	13-25	
	6-20	Extremely stony sandy clay loam, very gravelly sandy clay loam, gravelly loam	SC	A-2-6	0-31	6-20	70-84	11-68	9-63	4-34	29-40	13-21	
	20-39	Very gravelly sandy loam	SP-SC	A-2-4	0	2-6	80-93	34-54	25-42	9-17	25-30	9-13	
	39-53	Sandy loam	SC-SM	A-2-4	0	0	97-100	84-92	64-75	31-38	21-26	6-10	
	53-60	Gravelly loamy sand	SM	A-2-4	0	0	80-96	59-78	46-63	14-21	16-19	2-4	
Arizo, rarely flooded-----	0-2	Gravelly loamy sand	SM	A-2-4	0	0	76-96	59-78	45-60	13-19	0-17	NP-2	
	2-15	Gravelly loamy sand	SM	A-2-4	0	0	74-80	58-77	45-61	14-20	0-17	NP-2	
	15-59	Very gravelly sand	SP-SM	A-1-b	0	0-9	80-86	39-55	30-43	4-5	0-14	NP	

Table 18.-Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
4275: Pinkcan-----	In				Pct	Pct					Pct		
	0-1	Loam	CL										
	1-11	Loam, gravelly loam, sandy loam, clay loam	SC	A-6 A-2-6	0	0-8	90-100	74-98	61-91	47-71	21-31	6-13	
					0	0-21	85-98	62-95	44-82	20-44	25-40	9-21	
	11-19	Gravelly sandy clay loam, very gravelly sandy clay loam, sandy clay loam	SC	A-6	0	0-19	73-98	39-95	32-89	16-49	29-40	13-21	
	19-25	Gravelly loam, very cobbly sandy clay loam, gravelly sandy clay loam, loam	CL	A-6	0	0-19	79-98	44-95	35-86	23-59	25-35	9-17	
	25-28	Sandy loam	SC	A-2-4	0	0-7	86-98	58-86	40-66	17-32	19-25	4-9	
	28-33	Gravelly sandy loam	SC-SM	A-1-b	0	0-7	86-94	58-78	42-63	18-30	19-25	4-9	
Werewolf-----	33-47	Loamy sand, gravelly sandy loam	SC-SM	A-2-4	0	0-7	86-96	58-84	41-66	19-33	19-25	4-9	
	47-60	Cemented very gravelly loamy sand, cemented loamy sand, cemented gravelly sandy loam	SM	A-2-4	0	0-6	75-98	43-85	33-72	12-30	15-22	1-7	
	0-1	Loamy sand	SM	A-2-4	0	0-7	92-98	77-97	60-77	19-26	0-18	NP-3	
	1-15	Sandy loam	SC-SM	A-2-4	0	0-3	92-97	77-92	58-75	28-39	19-26	4-10	
	15-31	Very gravelly sandy loam	SC	A-2-4	0	7-29	71-86	34-59	25-49	13-27	20-28	6-12	
	31-41	Very gravelly sandy loam	SC	A-2-4	0	6-29	73-87	32-56	24-46	12-26	20-28	6-12	
	41-54	Gravelly loamy coarse sand	SC-SM	A-1-b	0	0-13	80-86	54-66	29-37	11-16	17-20	3-5	
Gocougs, warm----	54-65	Sandy loam	SC-SM	A-2-4	0	0-7	93-98	78-92	55-67	20-26	17-20	3-5	
	0-1	Fine sandy loam	SC	A-4	0	0	97-100	81-97	69-87	40-51	22-28	7-10	
	1-8	Loam, clay loam	CL	A-6	0	0	98-100	83-98	58-88	39-66	20-40	4-20	
	8-34	Gravelly loam, gravelly sandy clay loam	SC	A-2-6	0	0-7	87-93	48-64	37-55	17-27	27-35	12-17	
	34-39	Cemented sandy loam, cemented very gravelly loamy sand	SM	A-1-b	0	0	80-97	54-85	43-70	16-27	16-21	2-4	
4280: Mekkadale-----	0-1	Loam	SC	A-4	0	0-1	92-95	76-83	59-72	38-48	19-27	4-10	
	1-12	Sandy clay loam, loam	CL	A-6	0	0	92-100	76-91	64-84	46-63	30-38	13-19	
	12-19	Sandy clay loam, sandy loam	SC	A-6	0	0	92-100	77-92	63-80	34-45	25-30	9-12	
	19-26	Cemented sandy loam, cemented loamy sand	SM	A-2-4	0	0	93-98	78-95	59-79	18-29	0-21	NP-5	
	26-59	Coarse sand, gravelly loamy sand	SM	A-1-b	0	0	73-100	59-98	45-82	15-32	0-20	NP-5	



Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>		
4280: Edalaph, warm----	0-2	Gravelly sandy loam	SC-SM	A-2-4			0	0	88-90	69-76	49-59	22-29	16-24	2-7
	2-15	Gravelly sandy loam	SC-SM	A-2-4			0	0	93-100	70-97	48-73	20-35	16-23	2-7
	15-20	Sandy loam	SC-SM	A-2-4			0	0	93-100	70-97	49-74	19-33	16-22	2-6
	20-31	Loamy coarse sand	SM	A-1-b			0	0	93-100	72-97	38-56	15-24	0-17	NP-1
	31-59	Gravelly loamy coarse sand	SM	A-1-b			0	0	90-97	66-92	34-52	12-21	0-17	NP-2
4285: Typic Argidurids	0-1	Extremely gravelly fine sandy loam	GP	A-1-a			0-1	0-5	34-37	6-13	5-11	3-7	20-23	6-7
	1-2	Fine sandy loam	SC-SM	A-4			0	0	92-98	84-97	72-85	43-52	21-24	6-7
	2-7	Gravelly loam	SC	A-2-6			0	0-2	76-78	50-56	43-50	30-36	28-33	12-15
	7-18	Very gravelly clay loam	SC	A-2-6			0	0-2	62-71	30-50	28-47	22-38	36-39	18-21
	18-23	Very gravelly loam	GC	A-2-6			0	0-2	61-72	31-50	25-44	17-31	25-32	9-15
23-33	Cemented material	---	---	---	---	---	---	---	---	---	---	---	---	---
Coppermine-----	0-1	Fine sandy loam	SC-SM	A-4			0	0-4	92-97	76-91	66-85	28-39	17-24	3-7
	1-8	Very gravelly sandy loam	SC	A-2-6			0	0-1	58-73	28-52	20-41	11-25	22-30	7-13
	8-11	Extremely gravelly sandy clay loam	GP-GC	A-2-6			0	0-5	52-58	17-27	14-24	8-13	29-32	13-15
	11-20	Bedrock	---	---	---	---	---	---	---	---	---	---	---	---
Minhoyt, warm----	0-1	Fine sandy loam	SC-SM	A-4			0	0	94-100	78-98	67-90	40-55	20-26	5-9
	1-7	Loam, sandy loam	CL	A-4			0	0-3	93-95	86-91	66-80	41-54	0-25	NP-8
	7-59	Cemented material	---	---	---	---	---	---	---	---	---	---	---	---
4403: Arizo, rarely flooded, channeled-----	0-6	Gravelly sand	SP-SM	A-1-b			0	0-6	79-86	62-72	48-56	7-9	0-14	NP
	6-59	Extremely gravelly coarse sand	GP	A-1-a			0-5	9-26	43-65	11-37	5-16	1-3	0-14	NP
Arizo, rarely flooded-----	0-6	Gravelly sand	SP-SM	A-1-b			0	0-6	79-86	62-72	48-56	7-9	0-14	NP
	6-59	Extremely gravelly coarse sand	GP	A-1-a			0-5	9-26	43-65	11-37	5-16	1-3	0-14	NP
Arizo-----	0-4	Sandy loam	SM	A-2-4			0	0-1	88-100	78-92	61-72	33-39	16-18	2-3
	4-59	Extremely gravelly coarse sand	GP	A-1-a			0-5	9-26	43-65	11-37	5-16	1-3	0-14	NP

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--						Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200	Pct			
												Pct		
4440: Dragonwash, occasionally flooded-----	In													
	0-1	Gravelly loamy sand	SM	A-2-4	0	0-2	72-92	58-84	44-69	12-22			0-20	NP-4
	1-5	Gravelly sand, sand	SP-SM	A-3	0	0	86-98	59-92	46-73	5-10			0-14	NP
Dragonwash, frequently flooded-----	5-59	Very gravelly coarse sand, very gravelly sand	SP	A-1-b	0	0-5	69-87	31-65	24-51	3-7			0-14	NP
	0-1	Gravelly sand	SP-SM	A-2-4	0	0-2	73-93	59-78	46-61	8-11			0-14	NP
	1-10	Gravelly sand, sand, very gravelly sand	SP	A-1-b	0	0-6	74-98	36-92	28-73	3-10			0-14	NP
4450: Morongo, occasionally flooded-----	10-59	Very gravelly coarse sand, very gravelly sand	SP	A-1-b	0	0-5	60-83	25-65	19-51	2-7			0-14	NP
	0-6	Sand	SP-SM	A-3, A-2-4	0	0	100	80-92	61-77	7-14			0-19	NP-4
	6-18	Gravelly coarse sand, loamy sand, sand	SP-SM	A-1-b	0	0	93-100	72-93	32-46	6-13			0-19	NP-4
Morongo, frequently flooded-----	18-60	Coarse sand, loamy sand, sand	SM	A-2-4	0	0	100	80-97	62-81	10-18			0-19	NP-4
	0-2	Sand	SP-SM	A-2-4	0	0	97-100	79-92	61-76	9-16			0-21	NP-4
	2-7	Sand, loamy sand, gravelly sand	SW-SM	A-3, A-2-4	0	0	93-100	71-92	55-76	8-16			0-21	NP-4
4605: Pinecity, moist-	7-60	Gravelly loamy sand, gravelly coarse sand, sand, loamy sand	SP-SM	A-1-b	0	0	86-100	65-92	28-45	4-11			0-21	NP-4
	0-1	Loamy sand	SM	A-2-4	0	0	94-100	79-97	60-79	14-23			0-21	NP-5
	1-8	Loamy sand, gravelly loamy sand	SC-SM	A-2-4	0	0	79-100	58-97	44-77	10-21			0-19	NP-4
	8-59	Bedrock			0	0	---	---	---	---			---	---

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>					<u>Pct</u>						<u>Pct</u>		
4606: Pinecity-----	0-1	Gravelly loamy sand	SM	A-1-b, A-2-4	0	0-7	82-92	55-84	41-68	11-23		0-21	NP-5	
	1-6	Sand, gravelly sand, gravelly loamy sand, loamy sand	SP-SM, SM, SC-SM	A-1-b, A-2-4	0	0-4	83-100	56-94	41-76	10-24		0-20	NP-4	
	6-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---	
Rock outcrop.														
4607: Pinecity-----	0-2	Sand	SP-SM	A-3	0	0	90-100	82-97	64-82	9-17		0-22	NP-5	
	2-6	Sand, loamy sand	SP-SM	A-2-4	0	0-15	92-100	84-97	64-80	9-17		0-21	NP-4	
	6-59	Bedrock			0	0	---	---	---	---	---	---	---	
4608: Pinecity-----	0-2	Loamy sand	SM	A-2-4	0	0	89-97	82-94	61-76	18-26		0-21	NP-5	
	2-5	Sand, loamy sand	SM	A-2-4	0	0	90-97	82-94	60-75	17-26		0-19	NP-4	
	5-59	Bedrock			0	0	---	---	---	---	---	---	---	
Rock outcrop.														
4610: Desertqueen-----	0-2	Sandy loam	SM	A-2-4	0	0	95-98	78-92	58-72	26-34	17-22	3-6		
	2-5	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SC-SM, SC	A-2-6, A-2-4	0	0-6	80-95	47-85	33-67	15-35	20-29	6-12		
	5-12	Gravelly sandy loam, very gravelly sandy loam, coarse sandy loam	SC-SM, SC	A-2-4, A-2-6	0	0-13	77-95	55-86	29-53	16-31	20-29	6-12		
	12-14	Extremely gravelly loamy coarse sand	SP-SC, SW	A-1-a	0	0	84-100	10-30	5-16	2-6	17-19	3-4		
	14-59	Bedrock	---	---	---	---	---	---	---	---	---	---		
	0-1	Loamy sand	SM	A-2-4	0	0	96-100	75-97	57-81	17-29	0-22	NP-6		
	1-3	Loamy sand, gravelly sandy loam	SM	A-2-4	0	0	92-100	78-92	57-75	16-26	0-22	NP-6		
	3-17	Sandy loam, gravelly sandy loam	SC-SM	A-2-4	0	0	85-100	64-92	42-72	13-30	17-29	3-12		
	17-28	Gravelly loamy sand, sandy loam	SC-SM	A-2-4	0	0	86-92	65-90	51-81	13-29	17-29	3-12		
	28-53	Gravelly loamy sand, loamy sand	SM	A-2-4	0	0-4	87-97	61-95	46-76	13-26	0-19	NP-4		
	53-71	Gravelly sand, gravelly loamy sand, loamy sand	SP-SM	A-2-4, A-3	0	0-3	86-100	69-98	53-81	6-14	0-19	NP-4		
Rock outcrop.														

Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquidity limit	Plasticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
4615: Desertqueen, cool-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
	0-3	Sandy loam	SM	A-2-4	0	0	95-98	78-92	58-72	26-34	17-22	3-6	
	3-13	Very gravelly sandy loam, gravelly sandy loam, sandy loam	SC, SC-SM	A-4, A-2-6, A-2-4	0	0-6	80-98	47-90	35-74	17-40	20-29	6-12	
	13-59	Bedrock	---	---	---	---	---	---	---	---	---	---	
Jumborox-----	0-1	Sand	SM	A-2-4	0	0	94-100	79-98	61-78	9-15	0-17	NP-2	
	1-4	Gravelly loamy sand, sand, loamy sand	SM	A-1-b, A-2-4	0	0	93-100	65-98	48-81	14-29	0-22	NP-6	
	4-14	Gravelly sandy loam, gravelly loamy sand, sandy loam, loamy sand	SC-SM, SC	A-1-b, A-2-4	0	0	93-100	64-98	45-82	18-39	17-29	3-12	
	14-22	Gravelly sandy loam, gravelly loamy sand, sandy loam, loamy sand	SC, SC-SM	A-1-b, A-2-4	0	0	93-100	64-98	45-81	18-40	17-29	3-12	
Rock outcrop.	22-37	Gravelly loamy sand, loamy sand, gravelly sandy loam, sandy loam	SM, SC	A-2-4	0	0	93-100	65-98	52-90	15-35	17-29	3-12	
	37-71	Gravelly loamy sand, loamy sand, loamy coarse sand	SM	A-1-b, A-2-4	0	0-4	86-100	59-98	44-79	12-25	0-19	NP-4	
4620: Stranger-----	0-1	Loamy sand	SM	A-2-4	0	0	92-97	77-84	59-70	21-28	0-20	NP-4	
	1-3	Gravelly sand, gravelly loamy sand, sand, loamy sand	SP-SM	A-3	0	0	86-100	59-92	46-75	5-12	0-16	NP-2	
	3-13	Bedrock	---	---	---	---	---	---	---	---	---	---	
Rock outcrop.													
Grubstake, moist	0-1	Loamy fine sand	SM	A-2-4	0	0	92-98	79-92	74-90	23-31	15-20	1-4	
	1-15	Fine sandy loam, sandy loam	SC-SM	A-2-4	0-13	0-6	76-97	46-84	33-66	14-31	19-26	4-9	
	15-18	Bedrock	---	---	---	---	---	---	---	---	---	---	
	18-28	Bedrock	---	---	---	---	---	---	---	---	---	---	

Table 18.--Engineering Properties-Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200				
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>		
4625: Grinder-----														
	0-0	Gravelly fine sandy loam	SC-SM	A-2-4			0	0	82-98	48-76	43-74	19-36	19-26	4-9
	0-3	Sandy clay loam, gravelly fine sandy loam	SC-SM	A-2-4			0	0	93-100	52-84	49-84	21-43	22-33	7-16
	3-8	Gravelly loam, gravelly sandy loam	SC	A-2-4			0	0	94-96	53-77	39-58	16-26	25-29	9-12
	8-18	Bedrock		---			---	---	---	---	---	---	---	---
Grinder, cool----														
	0-1	Gravelly loam	SC-SM	A-4			0	0	77-92	47-76	39-66	27-47	19-24	4-7
	1-3	Sandy clay loam, gravelly fine sandy loam	SC-SM	A-2-4			0	0	93-100	52-84	49-84	21-43	22-33	7-16
	3-8	Gravelly loam, gravelly sandy loam	SC	A-2-4			0	0	94-96	53-77	39-58	16-26	25-29	9-12
	8-18	Bedrock		---			---	---	---	---	---	---	---	---
Pinkcan, cool----														
	0-0	Sandy loam	SC-SM	A-2-4			0	0-7	86-100	76-98	58-83	28-44	21-29	6-11
	0-11	Loam, gravelly loam, sandy loam, clay loam	SC	A-2-6			0	0-21	85-98	62-95	44-82	20-44	25-40	9-21
	11-19	Gravelly sandy clay loam, very gravelly sandy clay loam, sandy clay loam	SC	A-6			0	0-19	73-98	39-95	32-89	16-49	29-40	13-21
	19-25	Gravelly loam, very cobbley sandy clay loam, gravelly sandy clay loam, loam	CL	A-6			0	0-19	79-98	44-95	35-86	23-59	25-35	9-17
	25-28	Sandy loam	SC	A-2-4			0	0-7	86-98	58-86	40-66	17-32	19-25	4-9
	28-33	Gravelly sandy loam	SC-SM	A-1-b			0	0-7	86-94	58-78	42-63	18-30	19-25	4-9
	33-47	Loamy sand, gravelly sandy loam	SC-SM	A-2-4			0	0-7	86-96	58-84	41-66	19-33	19-25	4-9
	47-60	Cemented very gravelly loamy sand, cemented loamy sand, cemented gravelly sandy loam	SM	A-2-4			0	0-6	75-98	43-85	33-72	12-30	15-22	1-7
4630: Thunderclap-----														
	0-2	Sand	SP-SM	A-3			0	0	98-100	92-97	71-77	8-11	0-16	NP-1
	2-11	Sand, loamy sand	SP-SM, SM	A-2-4			0	0	98-100	92-97	71-77	12-14	0-16	NP-1
	11-39	Sand, loamy sand	SP-SM	A-3			0	0	98-100	92-97	71-77	7-10	0-16	NP-1
	39-63	Gravelly loamy sand, loamy sand, gravelly sand, sand	SP-SM	A-3			0	0	97-100	76-97	58-77	5-10	0-16	NP-1
	63-79	Bedrock		---			---	---	---	---	---	---	---	---

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>						<u>Pct</u>						<u>Pct</u>	
4630: Smithcanyon-----														
	0-1	Loamy sand	SM	A-2-4		0	0	85-100	78-95	58-75	17-25	0-19	NP-3	
	1-8	Sand, gravelly sand, gravelly loamy sand, loamy sand	SM	A-2-4		0	0	93-98	59-91	45-72	13-24	0-19	NP-3	
	8-13	Sand, gravelly sand, gravelly loamy sand, loamy sand	SP-SM	A-1-b		0	0	79-99	59-90	45-73	7-14	0-19	NP-3	
	13-59	Bedrock	---	---		---	---	---	---	---	---	---	---	
4804: Rock outcrop.														
	0-2	Gravelly loamy sand	SM	A-2-4		0	0	72-85	58-77	45-63	16-24	0-21	NP-4	
	2-59	Bedrock	---	---		---	---	---	---	---	---	---	---	
Pinecity-----														
	0-1	Gravelly loamy sand	SM	A-1-b, A-2-4		0	0-7	82-92	55-84	41-68	11-23	0-21	NP-5	
	1-6	Sand, gravelly sand, gravelly loamy sand, loamy sand	SP-SM, SM, SC-SM	A-1-b, A-2-4		0	0-4	83-100	56-94	41-76	10-24	0-20	NP-4	
	6-59	Bedrock	---	---		---	---	---	---	---	---	---	---	
4805: Rock outcrop.														
	0-2	Gravelly loamy sand	SM	A-2-4		0	0	72-85	58-77	45-63	16-24	0-21	NP-4	
	2-59	Bedrock	---	---		---	---	---	---	---	---	---	---	
4806: Rock outcrop.														
4811: Rock outcrop.														
	0-4	Gravelly sand	SP-SM	A-1-b		0	0	97-100	55-78	42-62	4-9	0-19	NP-3	
	4-10	Gravelly loamy sand, sand, gravelly sand	SP-SC	A-1-b		0	0	93-100	57-85	42-67	8-16	0-20	NP-4	
	10-20	Bedrock	---	---		---	---	---	---	---	---	---	---	
4825: Rock outcrop.														
	0-1	Loamy fine sand	SM	A-2-4		0	0	92-98	79-92	74-90	23-31	15-20	1-4	
	1-15	Fine sandy loam, sandy loam	SC-SM	A-2-4		0-13	0-6	76-97	46-84	33-66	14-31	19-26	4-9	
	15-18	Bedrock	---	---		---	---	---	---	---	---	---	---	
	18-28	Bedrock	---	---		---	---	---	---	---	---	---	---	

Table 18.--Engineering Properties--Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	Pct	4	10	40	200			
	<u>In</u>					<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
4825: Cajon, rarely flooded-----														
	0-1	Sand	SP-SM	A-3	0	0	0	97-98	84-94	64-76	8-12	0-18	NP-3	
	1-19	Gravelly loamy sand, loamy sand	SM	A-2-4	0	0	0	86-100	64-92	49-73	17-27	0-17	NP-2	
	19-38	Gravelly loamy sand, gravelly loamy coarse sand	SP-SM	A-1-b	0	0	0	93-100	57-78	30-44	10-16	0-16	NP-1	
	38-59	Gravelly coarse sand, gravelly sand	SW	A-1-b	0	0	0	93-96	54-78	24-37	4-10	0-17	NP-2	
Stranger, warm--														
	0-1	Sand	SP-SM	A-3	0	0	0	93-98	73-85	56-69	7-11	0-17	NP-2	
	1-9	Gravelly sand, gravelly loamy sand, sand, loamy sand	SP-SM	A-3	0	0	0	86-100	59-92	46-75	5-12	0-16	NP-2	
	9-19	Bedrock	---	---	---	---	---	---	---	---	---	---	---	
4830: Rock outcrop.														
Pinecity, cool--	0-1	Gravelly loamy sand	SM	A-1-b, A-2-4	0	0-7	0	82-92	55-84	41-68	11-23	0-21	NP-5	
	1-6	Sand, gravelly sand, gravelly loamy sand, loamy sand	SP-SM, SM, SC-SM	A-1-b, A-2-4	0	0-4	0	83-100	56-94	41-76	10-24	0-20	NP-4	
	6-59	Bedrock	---	---	---	---	---	---	---	---	---	---	---	
4900: Rock outcrop.														
Aguilareal-----	0-3	Stones	GW-GM	A-1-a	20-25	15-20	0	50-54	23-32	18-26	5-9	15-20	1-4	
	3-4	Very gravelly loamy sand	SP-SM	A-1-b	0-5	0-8	0	60-73	33-53	26-43	9-17	15-21	1-4	
	4-14	Extremely gravelly sandy loam, very gravelly fine sandy loam, very gravelly sandy loam	SC-SM	A-1-b	0-11	0-28	0	70-85	26-72	19-61	9-32	18-29	4-11	
	14-19	Extremely gravelly sandy loam, extremely cobbly sandy loam, very gravelly sandy loam, very gravelly fine sandy loam	SC	A-2-4	0-16	13-27	0	53-85	17-66	13-54	6-30	18-29	4-11	
19-29	Bedrock	---	---	---	---	---	---	---	---	---	---	---		



Table 18.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 in	3-10 in	4	10	40	200			
4900: Lostpalms-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>		
	0-1	Gravelly loamy fine sand	SM										
	1-7	Very gravelly loamy sand, very cobbly	SM	A-2-4 A-2-4	0	2-13	80-92	54-81	50-81	15-29	0-22	NP-6	
		loamy fine sand			0	7-32	74-85	48-72	43-71	13-25	0-21	NP-5	
	7-17	Bedrock	---	---	---	---	---	---	---	---	---	---	

Table 19.—Physical Soil Properties

(Sand, silt, and clay values are shown either as a range or as a representative value. Absence of an entry indicates that data were not estimated. Soil properties are measured or inferred from direct observations in the field or laboratory)

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1220:									
Jadestorm-----	0-2	80-84	5	4-12	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	2-3	80-84	5	4-12	1.55-1.65	7.1-14.2	0.02-0.05	0.1-0.8	0.0-0.5
	3-10	48-85	8	6-16	1.45-1.55	0.1-9.9	0.04-0.11	0.1-1.0	0.0-0.3
	10-17	---	---	0-0	---	0.1-1.4	0.00-0.01	---	0.0-0.0
	17-26	---	---	---	---	0.0-0.0	0.00-0.00	---	---
Blackeagle, cool	0-2	80-85	10	4-9	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	2-3	80-85	10	4-9	1.55-1.65	7.1-14.2	0.02-0.04	0.1-0.5	0.0-0.5
	3-11	80-85	10	8-9	1.55-1.65	7.1-14.2	0.01-0.03	0.2-0.5	0.0-0.3
	11-18	56-75	15	8-18	1.50-1.60	2.8-9.9	0.04-0.07	0.2-1.1	0.0-0.3
	18-30	---	---	---	---	0.0-0.1	0.00-0.00	---	---
1225:									
Blackeagle-----	0-3	56-75	19	6-12	1.50-1.60	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	3-4	56-75	19	6-12	1.50-1.60	2.8-9.9	0.03-0.05	0.1-0.4	0.0-0.5
	4-14	56-75	15	8-18	1.50-1.60	2.8-9.9	0.04-0.07	0.2-1.1	0.0-0.3
	14-24	---	---	---	---	0.0-0.1	0.00-0.00	---	---
1230:									
Jadestorm-----	0-3	70-80	22	6-12	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	3-7	70-80	22	6-12	1.55-1.65	7.1-14.2	0.02-0.05	0.1-0.5	0.0-0.5
	7-11	48-85	8	6-16	1.45-1.55	0.1-9.9	0.04-0.11	0.1-1.0	0.0-0.3
	11-20	---	---	0-0	---	0.1-1.4	0.00-0.01	---	0.0-0.0
	20-30	---	---	---	---	0.0-0.0	0.00-0.00	---	---
Jadestorm, cool-	0-2	70-80	22	6-12	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	2-3	70-80	22	6-12	1.55-1.65	7.1-14.2	0.02-0.05	0.2-0.8	0.0-0.5
	3-10	48-85	8	6-16	1.45-1.55	0.1-9.9	0.04-0.11	0.1-1.0	0.0-0.3
	10-17	---	---	0-0	---	0.1-1.4	0.00-0.01	---	0.0-0.0
	17-26	---	---	---	---	0.0-0.0	0.00-0.00	---	---
1240:									
Meccapass-----	0-1	79	15	6-10	1.60-1.70	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	1-2	79	15	6-10	1.60-1.70	7.1-14.2	0.05-0.09	0.4-1.0	0.0-0.5
	2-16	40-70	40	6-18	1.50-1.60	2.8-9.9	0.04-0.09	0.1-1.5	0.0-0.3
	16-37	57	30	6-14	1.50-1.60	2.8-9.9	0.02-0.05	0.1-0.5	0.0-0.3
	37-59	---	---	---	---	0.0-0.1	0.00-0.01	---	---
Bulletproof----	0-3	87	9	1-5	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.0
	3-6	87	9	1-8	1.55-1.65	7.1-14.2	0.04-0.07	0.0-0.6	0.0-0.5
	6-11	85	9	1-10	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.6	0.0-0.3
	11-59	---	---	---	---	0.1-1.4	---	---	---

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1241: Meccapass-----	0-1	65	24	6-12	1.50-1.60	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	1-2	65	24	6-12	1.50-1.60	2.8-9.9	0.07-0.11	0.4-1.0	0.0-0.5
	2-16	40-70	40	6-18	1.50-1.60	2.8-9.9	0.04-0.09	0.1-1.5	0.0-0.3
	16-27	57	30	6-14	1.50-1.60	2.8-9.9	0.02-0.05	0.1-0.5	0.0-0.3
	27-59	---	---	---	---	0.0-0.1	0.00-0.01	---	---
Seanna-----	0-1	70	21	8-18	1.45-1.55	2.8-9.9	0.08-0.11	0.4-1.6	0.0-0.5
	1-12	70	22	8-18	1.50-1.60	2.8-9.9	0.04-0.13	0.2-1.6	0.0-0.5
	12-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Contactmine, dry	0-2	70-72	10-22	6-18	1.45-1.55	2.8-9.9	0.08-0.12	0.4-1.6	0.0-0.5
	2-6	65-75	7-18	7-18	1.45-1.55	1.0-2.8	0.09-0.12	0.3-1.7	0.0-0.3
	6-11	30-65	5-53	17-30	1.45-1.55	0.1-4.2	0.11-0.15	0.9-3.9	0.0-0.3
	11-25	35-65	17-47	18-28	1.45-1.55	0.1-1.4	0.10-0.14	1.1-3.1	0.0-0.3
	25-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
1242: Meccapass-----	0-1	60	31	6-10	1.50-1.60	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	1-2	60	31	6-10	1.50-1.60	2.8-9.9	0.04-0.09	0.3-0.6	0.0-0.5
	2-16	40-70	40	6-18	1.50-1.60	2.8-9.9	0.04-0.09	0.1-1.5	0.0-0.3
	16-27	57	30	6-14	1.50-1.60	2.8-9.9	0.02-0.05	0.1-0.5	0.0-0.3
	27-59	---	---	---	---	0.0-0.1	0.00-0.01	---	---
Jadestorm-----	0-2	70-80	22	6-12	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	2-3	70-80	22	6-12	1.45-1.55	2.8-9.9	0.07-0.10	0.3-0.9	0.0-0.5
	3-8	48-85	8	6-16	1.45-1.55	0.1-9.9	0.04-0.11	0.1-1.0	0.0-0.3
	8-20	---	---	0-0	---	0.1-1.4	0.00-0.01	---	0.0-0.0
	20-30	---	---	---	---	0.0-0.0	0.00-0.00	---	---
1250: Ironlung-----	0-2	90	7	1-5	1.60-1.70	7.1-14.2	0.02-0.06	0.0-0.3	0.0-0.5
	2-6	95	3	1-5	1.75-1.85	7.1-14.2	0.01-0.06	0.0-0.3	0.0-0.3
	6-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Ironlung, cool--	0-1	95	3	1-5	1.60-1.70	7.1-14.2	0.02-0.06	0.0-0.3	0.0-0.5
	1-4	97	2	1-5	1.65-1.75	7.1-14.2	0.02-0.06	0.0-0.3	0.0-0.3
	4-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
1255: Goldenhills-----	0-2	85	10	3-8	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.0
	2-3	85	10	3-8	1.55-1.65	7.1-14.2	0.02-0.06	0.1-0.3	0.0-0.5
	3-10	78	17	3-10	1.60-1.70	7.1-14.2	0.02-0.07	0.1-0.5	0.0-0.3
	10-26	80	15	1-10	1.60-1.70	7.1-14.2	0.01-0.06	0.0-0.6	0.0-0.3
	26-47	85	11	1-10	1.60-1.70	7.1-14.2	0.01-0.06	0.0-0.6	0.0-0.3
	47-57	---	---	---	---	0.0-0.0	0.00-0.00	---	---

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Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1255: Bulletproof----	0-2	87	9	1-5	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.0
	2-3	87	9	1-8	1.55-1.65	7.1-14.2	0.02-0.07	0.0-0.3	0.0-0.5
	3-5	85	11	1-10	1.60-1.70	7.1-14.2	0.03-0.07	0.0-0.8	0.0-0.3
	5-14	80	12	1-8	1.60-1.70	7.1-14.2	0.04-0.07	0.0-0.8	0.0-0.3
	14-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Fanhill-----	0-5	76	18	6-8	1.45-1.55	14.2-19.8	0.01-0.02	0.0-0.1	0.0-0.5
	5-6	76	18	6-8	1.45-1.55	2.8-9.9	0.10-0.14	0.0-0.1	0.0-0.5
	6-15	70	19	6-12	1.45-1.55	2.8-9.9	0.07-0.11	0.3-1.0	0.0-0.3
	15-18	85	9	6-12	1.65-1.75	7.1-14.2	0.04-0.06	0.1-0.9	0.0-0.3
	18-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Whiterobe-----	0-1	85	11	1-4	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.0
	1-2	85	11	1-4	1.55-1.65	7.1-14.2	0.02-0.06	0.0-0.2	0.0-0.3
	2-12	80	14	1-6	1.60-1.70	7.1-14.2	0.03-0.06	0.0-0.3	0.0-0.3
	12-26	90	7	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	26-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
1260: Whiterobe-----	0-1	85	11	1-4	1.55-1.65	7.1-14.2	0.02-0.06	0.0-0.2	0.0-0.3
	1-11	80	14	1-6	1.60-1.70	7.1-14.2	0.03-0.06	0.0-0.4	0.0-0.3
	11-24	90	7	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Bigbernie-----	0-1	85	12	2-5	1.55-1.65	7.1-14.2	0.05-0.06	0.1-0.3	0.0-0.5
	1-4	80	16	2-5	1.60-1.70	7.1-14.2	0.03-0.04	0.0-0.3	0.0-0.3
	4-24	90	8	1-4	1.65-1.75	7.1-14.2	0.02-0.04	0.0-0.2	0.0-0.3
	24-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Whiterobe, cool-	0-1	85	11	1-4	1.55-1.65	7.1-14.2	0.02-0.06	0.0-0.2	0.0-0.3
	1-11	80	14	1-6	1.60-1.70	7.1-14.2	0.03-0.06	0.0-0.4	0.0-0.3
	11-24	90	7	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
1410: Missionwell-----	0-2	79-87	12	6-8	1.60-1.70	14.2-19.8	0.00-0.01	0.0-0.1	0.0-0.5
	2-3	79-87	12	6-8	1.60-1.70	7.1-14.2	0.03-0.04	0.1-0.3	0.0-0.5
	3-8	40-78	33	8-15	1.45-1.60	0.1-9.9	0.04-0.07	0.1-0.9	0.0-0.5
	8-18	---	---	---	---	0.0-0.1	0.00-0.01	---	---
Missionwell, high elevation-	0-2	55-78	26	6-12	1.45-1.55	14.2-19.8	0.00-0.01	0.0-0.2	0.0-0.5
	2-3	55-78	26	6-12	1.45-1.55	2.8-9.9	0.07-0.08	0.2-0.6	0.0-0.5
	3-8	40-78	33	8-15	1.45-1.60	0.1-9.9	0.04-0.07	0.1-0.9	0.0-0.5
	8-18	---	---	---	---	0.0-0.1	0.00-0.01	---	---

Soil Survey of Joshua Tree National Park, California

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1415: Bolero-----	0-6	77-87	10	2-6	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.5
	6-7	77-87	15	2-6	1.55-1.65	7.1-14.2	0.03-0.04	0.1-0.3	0.0-0.5
	7-12	77-87	13	4-10	1.60-1.70	7.1-14.2	0.05-0.07	0.1-0.5	0.0-0.3
	12-15	77-87	11	4-10	1.60-1.70	7.1-14.2	0.04-0.06	0.1-0.5	0.0-0.3
	15-19	77-87	11	4-10	1.60-1.70	7.1-14.2	0.00-0.01	0.0-0.2	0.0-0.3
	19-29	---	---	---	---	0.0-0.0	0.00-0.01	---	---
1504: Rizzo, rarely flooded, stony-	0-1	73-80	18	1-5	1.55-1.65	7.1-14.2	0.07-0.11	0.1-0.4	0.0-0.5
	1-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
Rizzo, occasionally flooded, stony-	0-2	75-87	13	2-6	1.65-1.75	7.1-14.2	0.04-0.06	0.1-0.4	0.0-0.5
	2-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
1510: Carrizo, very gravelly sandy loam-----	0-1	76	15	2-10	1.45-1.55	1.4-10.6	0.05-0.09	0.0-0.6	0.0-0.5
	1-5	79	13	2-10	1.50-1.60	7.1-14.2	0.05-0.09	0.0-0.7	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	5.9-20.0	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	5.9-20.0	0.02-0.05	0.0-0.3	0.0-0.5
1511: Carrizo, channeled-----	0-1	81	17	2-8	1.45-1.55	7.1-14.2	0.05-0.09	0.1-0.6	0.0-0.5
	1-5	97	1	2-8	1.50-1.60	7.1-14.2	0.05-0.09	0.0-0.5	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	7.1-14.2	0.02-0.05	0.0-0.3	0.0-0.5
Carrizo, occasionally flooded-----	0-1	87	9	3-8	1.45-1.55	7.1-14.2	0.05-0.09	0.0-0.5	0.0-0.5
	1-5	97	1	2-8	1.50-1.60	7.1-14.2	0.03-0.05	0.0-0.6	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	7.1-14.2	0.02-0.05	0.0-0.3	0.0-0.5

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1512: Carrizo, extremely gravelly sandy loam-----	0-1 1-4 4-59	79 95 88	11 2 6	4-10 2-8 2-6	1.45-1.55 1.65-1.75 1.60-1.70	2.8-9.9 7.1-14.2 7.1-14.2	0.04-0.06 0.02-0.04 0.03-0.05	0.1-0.3 0.0-0.3 0.0-0.2	0.0-0.5 0.0-0.3 0.0-0.3
1513: Carrizo-----	0-1 1-5 5-13 13-59	55-78 79 92 96	17 13 4 2	5-10 2-8 2-6 2-6	1.45-1.55 1.50-1.60 1.60-1.70 1.60-1.70	2.8-9.9 7.1-14.2 7.1-14.2 7.1-14.2	0.11-0.13 0.05-0.09 0.03-0.05 0.02-0.05	0.3-0.8 0.0-0.5 0.0-0.3 0.0-0.3	0.0-0.5 0.0-0.5 0.0-0.5 0.0-0.5
Carrizo, occasionally flooded, channeled-----	0-1 1-5 5-13 13-59	80-87 79 92 96	13 13 4 2	2-8 2-10 2-6 2-6	1.55-1.65 1.50-1.60 1.60-1.70 1.60-1.70	7.1-14.2 7.1-14.2 7.1-14.2 7.1-14.2	0.02-0.03 0.05-0.09 0.03-0.05 0.02-0.05	0.0-0.3 0.0-0.7 0.0-0.3 0.0-0.3	0.0-0.5 0.0-0.5 0.0-0.5 0.0-0.5
Rubylee-----	0-2 2-5 5-18 18-59	55-78 55-78 55-78 72-93	7-37 4-35 4-35 4-25	8-15 10-18 10-18 3-16	1.45-1.55 1.50-1.60 1.50-1.60 1.50-1.70	2.8-9.9 2.8-9.9 2.8-9.9 2.8-14.2	0.13-0.15 0.07-0.09 0.08-0.10 0.04-0.08	0.6-1.5 0.6-1.8 0.6-1.8 0.1-1.6	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3
1514: Carrizo, rarely flooded-----	0-1 1-5 5-59	72-87 90 95	15 6 1	5-10 2-8 2-6	1.55-1.65 1.50-1.60 1.60-1.70	7.1-14.2 7.1-14.2 7.1-14.2	0.04-0.06 0.05-0.09 0.03-0.05	0.2-0.7 0.1-0.6 0.1-0.3	0.0-0.5 0.0-0.5 0.0-0.5
Pintobasin, fine sandy loam-----	0-2 2-4 4-24 24-59	75 91 84 85	18 6 13 12	5-10 2-6 1-6 1-6	1.45-1.55 1.60-1.70 1.55-1.65 1.60-1.70	2.8-7.8 7.1-14.2 7.1-14.2 7.1-14.2	0.12-0.15 0.04-0.07 0.08-0.11 0.06-0.08	0.3-0.8 0.1-0.4 0.0-0.5 0.0-0.5	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3
Rubylee-----	0-2 2-5 5-18 18-59	55-78 55-78 55-78 72-93	7-37 4-35 4-35 4-25	8-15 10-18 10-18 3-16	1.45-1.55 1.50-1.60 1.50-1.60 1.50-1.70	2.8-9.9 2.8-9.9 2.8-9.9 2.8-14.2	0.13-0.15 0.07-0.09 0.08-0.10 0.04-0.08	0.6-1.5 0.6-1.8 0.6-1.8 0.1-1.6	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3
1515: Pintobasin-----	0-2 2-4 4-24 24-59	85 91 91 93	13 6 6 4	2-8 2-6 1-6 1-6	1.55-1.65 1.60-1.70 1.65-1.75 1.65-1.75	7.1-14.2 7.1-14.2 7.1-14.2 7.1-14.2	0.06-0.09 0.04-0.07 0.04-0.07 0.04-0.07	0.1-0.6 0.1-0.4 0.0-0.5 0.0-0.5	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3

Soil Survey of Joshua Tree National Park, California

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1515: Carrizo, occasionally flooded-----	0-1	87	9	3-8	1.45-1.55	7.1-14.2	0.05-0.09	0.0-0.5	0.0-0.5
	1-5	97	1	2-8	1.50-1.60	7.1-14.2	0.05-0.09	0.0-0.6	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	7.1-14.2	0.02-0.05	0.0-0.3	0.0-0.5
1516: Pintobasin, fine sandy loam-----	0-2	75	18	5-10	1.45-1.55	2.8-7.8	0.12-0.15	0.3-0.8	0.0-0.5
	2-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	84	13	1-6	1.55-1.65	7.1-14.2	0.08-0.11	0.0-0.5	0.0-0.3
	24-59	85	12	1-6	1.60-1.70	7.1-14.2	0.06-0.08	0.0-0.5	0.0-0.3
1517: Pintobasin-----	0-1	89	8	2-6	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.5	0.0-0.5
	1-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
Dalelake-----	0-4	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.5
	4-59	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
1520: Pintobasin, loamy sand-----	0-2	77	20	2-10	1.55-1.65	7.1-14.2	0.04-0.08	0.1-0.8	0.0-0.5
	2-14	85	13	2-6	1.60-1.75	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	14-35	95	4	1-6	1.60-1.75	7.1-14.2	0.03-0.08	0.0-0.5	0.0-0.3
	35-59	90	8	1-6	1.60-1.75	7.1-14.2	0.04-0.08	0.0-0.5	0.0-0.3
1522: Pintobasin, rarely flooded-	0-2	89	8	2-10	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.7	0.0-0.5
	2-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
1523: Pintobasin, rarely flooded-	0-2	89	8	2-10	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.7	0.0-0.5
	2-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1523: Aquepeak-----	0-0	87-97	7	3-6	1.60-1.70	7.1-14.2	0.03-0.04	0.1-0.3	0.0-0.5
	0-11	45-75	13	8-18	1.50-1.60	1.0-9.9	0.09-0.15	0.4-1.5	0.0-0.3
	11-19	55-87	10	3-12	1.50-1.70	0.0-0.1	0.00-0.01	0.1-0.8	0.0-0.3
	19-33	72-87	10	3-11	1.60-1.70	7.1-14.2	0.04-0.06	0.1-0.9	0.0-0.3
	33-59	80-97	7	3-11	1.60-1.70	7.1-14.2	0.03-0.06	0.1-0.9	0.0-0.3
Pintobasin, occasionally flooded-----	0-2	89	8	2-10	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.7	0.0-0.5
	2-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
1524: Pintobasin, rarely flooded-	0-2	95	3	2-8	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.6	0.0-0.5
	2-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
1525: Pintobasin, occasionally flooded-----	0-2	89	8	2-10	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.7	0.0-0.5
	2-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
Pintobasin, rarely flooded-	0-2	77	20	2-10	1.55-1.65	7.1-14.2	0.04-0.08	0.1-0.8	0.0-0.5
	2-14	85	13	2-6	1.60-1.75	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	14-35	95	4	1-6	1.60-1.75	7.1-14.2	0.03-0.08	0.0-0.5	0.0-0.3
	35-59	90	8	1-6	1.60-1.75	7.1-14.2	0.04-0.08	0.0-0.5	0.0-0.3
1526: Pintobasin, rarely flooded-	0-3	85	10	2-8	1.55-1.65	7.1-14.2	0.07-0.11	0.1-0.6	0.0-0.5
	3-7	85	12	2-6	1.60-1.70	7.1-14.2	0.05-0.07	0.1-0.4	0.0-0.3
	7-20	91	5	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	20-59	93	4	1-6	1.65-1.75	7.1-14.2	0.05-0.08	0.0-0.5	0.0-0.3
Joetree-----	0-2	75-87	16	1-6	1.55-1.65	7.1-14.2	0.06-0.08	0.0-0.5	0.0-0.5
	2-43	75-98	11	1-6	1.60-1.80	7.1-14.2	0.02-0.08	0.0-0.5	0.0-0.3
	43-65	50-78	23	16-28	1.45-1.55	0.1-4.2	0.14-0.18	1.1-3.1	0.0-0.3
	65-71	78-88	11	4-8	1.60-1.70	7.1-14.2	0.06-0.08	0.2-0.6	0.0-0.3



Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1526: Patscamp-----	0-1	72-87	16	2-6	1.55-1.65	7.1-14.2	0.06-0.11	0.1-0.5	0.0-0.5
	1-10	72-97	4	1-6	1.55-1.80	7.1-14.2	0.04-0.08	0.1-0.5	0.0-0.3
	10-17	46-75	26	20-26	1.45-1.55	0.1-4.2	0.12-0.17	1.8-2.8	0.0-0.3
	17-35	46-75	24	20-25	1.45-1.55	0.1-4.2	0.12-0.17	1.5-2.5	0.0-0.3
	35-45	55-78	22	18-18	1.50-1.60	1.0-2.8	0.09-0.12	1.5-1.6	0.0-0.3
	45-53	55-78	22	8-15	1.50-1.60	2.8-9.9	0.08-0.12	0.5-1.3	0.0-0.3
	53-63	55-78	12	8-15	1.50-1.60	2.8-9.9	0.08-0.12	0.5-1.2	0.0-0.3
1527: Pintobasin, moist-----	0-2	77	20	2-10	1.55-1.65	7.1-14.2	0.04-0.08	0.1-0.8	0.0-0.5
	2-14	85	13	2-6	1.60-1.75	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	14-35	95	4	1-6	1.60-1.75	7.1-14.2	0.03-0.08	0.0-0.5	0.0-0.3
	35-59	90	8	1-6	1.60-1.75	7.1-14.2	0.04-0.08	0.0-0.5	0.0-0.3
1530: Dalelake, fine sand-----	0-4	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.5
	4-59	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
1531: Dalelake-----	0-2	97	2	1-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	2-13	97	2	1-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	13-22	97	2	1-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	22-59	97	2	1-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
Pintobasin, rarely flooded-	0-2	89	8	2-10	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.7	0.0-0.5
	2-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
1540: Carrizo, very rarely flooded-	0-1	76	15	2-10	1.45-1.55	2.8-9.9	0.05-0.09	0.0-0.6	0.0-0.5
	1-5	79	12	2-10	1.50-1.60	2.8-9.9	0.05-0.09	0.0-0.7	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	7.1-14.2	0.02-0.05	0.0-0.3	0.0-0.5
Carrizo, stable-	0-1	55-78	17	5-10	1.45-1.55	2.8-9.9	0.11-0.13	0.3-0.8	0.0-0.5
	1-5	79	13	2-8	1.50-1.60	7.1-14.2	0.05-0.09	0.0-0.5	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	7.1-14.2	0.02-0.05	0.0-0.3	0.0-0.5

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1540: Carrizo, occasionally flooded, rocky surface-----	0-1 1-5 5-59	72-87 90 95	15 6 1	5-10 2-8 2-6	1.55-1.65 1.50-1.60 1.60-1.70	7.1-14.2 7.1-14.2 7.1-14.2	0.04-0.06 0.05-0.09 0.03-0.05	0.2-0.7 0.1-0.6 0.1-0.3	0.0-0.5 0.0-0.5 0.0-0.5
Russiroks-----	0-1 1-2 2-7 7-30 30-59	5-35 5-35 25-52 55-78 55-78	62 62 39 17 14	12-18 12-18 12-18 6-12 6-12	1.35-1.45 1.35-1.45 1.45-1.55 1.50-1.60 1.50-1.60	14.2-19.8 0.1-1.4 0.1-1.4 2.8-9.9 2.8-9.9	0.00-0.00 0.13-0.17 0.08-0.11 0.03-0.04 0.02-0.03	0.0-0.2 0.8-1.5 0.5-1.0 0.1-0.3 0.1-0.3	0.0-0.5 0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3
1541: Carrizo, stable-	0-1 1-5 5-13 13-59	55-78 79 92 96	17 13 4 2	5-10 2-8 2-6 2-6	1.45-1.55 1.50-1.60 1.60-1.70 1.60-1.70	2.8-9.9 7.1-14.2 7.1-14.2 7.1-14.2	0.11-0.13 0.05-0.09 0.03-0.05 0.02-0.05	0.3-0.8 0.0-0.5 0.0-0.3 0.0-0.3	0.0-0.5 0.0-0.5 0.0-0.5 0.0-0.5
Cambidic Haplodurids----	0-2 2-2 2-5 5-16 16-20 20-59	40-52 40-52 55-78 79-87 79-87 79-97	38 38 30 13 11 18	8-12 8-12 6-10 1-6 1-6 1-6	1.40-1.50 1.40-1.50 1.50-1.60 1.60-1.70 1.60-1.70 1.60-1.75	14.2-19.8 0.1-1.4 2.8-9.9 7.1-14.2 7.1-14.2 7.1-14.2	0.11-0.14 0.11-0.14 0.11-0.13 0.02-0.02 0.00-0.01 0.03-0.04	0.0-0.2 0.4-1.0 0.3-0.8 0.0-0.2 0.1-0.5 0.0-0.3	0.0-0.5 0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3 0.0-0.3
1542: Carrizo, very rarely flooded-	0-1 1-5 5-13 13-59	73 79 92 96	23 12 4 2	2-10 2-10 2-6 2-6	1.45-1.55 1.50-1.60 1.60-1.70 1.60-1.70	2.8-9.9 2.8-9.9 7.1-14.2 7.1-14.2	0.05-0.09 0.05-0.09 0.03-0.05 0.02-0.05	0.1-0.8 0.0-0.7 0.0-0.3 0.0-0.3	0.0-0.5 0.0-0.5 0.0-0.5 0.0-0.5
Carrizo, occasionally flooded-----	0-1 1-5 5-13 13-59	87 97 92 96	9 1 4 2	3-8 2-8 2-6 2-6	1.45-1.55 1.50-1.60 1.60-1.70 1.60-1.70	7.1-14.2 7.1-14.2 7.1-14.2 7.1-14.2	0.05-0.09 0.05-0.09 0.03-0.05 0.02-0.05	0.0-0.5 0.0-0.6 0.0-0.3 0.0-0.3	0.0-0.5 0.0-0.5 0.0-0.5 0.0-0.5
1550: Buzzardsprings, stable-----	0-3 3-25 25-59	72-80 78-89 78-97	18 13 4	5-8 1-8 1-6	1.45-1.55 1.55-1.65 1.60-1.75	2.8-9.9 7.1-14.2 7.1-14.2	0.11-0.14 0.05-0.06 0.03-0.07	0.4-0.7 0.1-0.6 0.0-0.5	0.0-0.5 0.0-0.3 0.0-0.3

Soil Survey of Joshua Tree National Park, California

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
1550: Coxpin-----	0-1 1-10 10-17 17-22 22-59	72-87 55-95 72-97 87-97 89-97	14 17 10 7 8	2-8 4-12 2-8 1-6 1-6	1.55-1.65 1.50-1.60 1.60-1.75 1.65-1.75 1.65-1.75	7.1-14.2 2.8-9.9 7.1-14.2 0.0-0.1 7.1-14.2	0.07-0.10 0.09-0.11 0.05-0.06 0.00-0.01 0.05-0.07	0.1-0.6 0.3-1.1 0.1-0.5 0.0-0.3 0.0-0.4	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.0 0.0-0.0
Dalelake-----	0-4 4-59	95 95	3 3	1-3 1-3	1.70-1.80 1.70-1.80	7.1-14.2 7.1-14.2	0.05-0.08 0.05-0.08	0.1-0.2 0.1-0.2	0.0-0.5 0.0-0.3
1555: Goldrose-----	0-1 1-6 6-21 21-31 31-59	77-87 77-97 87-97 77-99 77-99	11 10 7 2 2	4-6 2-6 1-4 1-4 1-4	1.60-1.70 1.60-1.75 1.60-1.70 1.60-1.80 1.60-1.80	7.1-14.2 7.1-14.2 7.1-14.2 7.1-14.2 7.1-14.2	0.07-0.09 0.04-0.08 0.04-0.06 0.02-0.05 0.02-0.07	0.2-0.4 0.1-0.4 0.0-0.2 0.0-0.2 0.0-0.2	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3 0.0-0.3
Carsitas, very rarely flooded-	0-1 1-59	88-97 87-97	7 8	2-5 1-4	1.60-1.70 1.65-1.75	7.1-14.2 7.1-14.2	0.04-0.07 0.04-0.06	0.1-0.3 0.0-0.4	0.0-0.5 0.0-0.3
Chemwash, rarely flooded-----	0-2 2-67	85 92	10 4	1-6 1-6	1.60-1.75 1.70-1.80	7.1-14.2 7.1-14.2	0.02-0.05 0.02-0.05	0.0-0.4 0.0-0.3	0.0-0.5 0.0-0.3
2003: Emptygun-----	0-2 2-10 10-20 20-60	75 75 80 85	21 17 14 13	4-12 7-10 6-12 2-6	1.55-1.65 1.50-1.60 1.60-1.70 1.60-1.70	7.1-14.2 2.8-9.9 7.1-14.2 7.1-14.2	0.05-0.07 0.07-0.11 0.04-0.09 0.01-0.04	0.1-0.7 0.4-0.8 0.2-0.7 0.0-0.3	0.0-0.5 0.0-0.4 0.0-0.3 0.0-0.3
2060: Joetree, very rarely flooded-	0-2 2-39 39-59 59-71	80-87 75-98 50-78 78-88	12 8 27 11	1-6 1-6 16-28 4-8	1.55-1.65 1.60-1.80 1.45-1.55 1.60-1.70	7.1-14.2 7.1-14.2 0.1-4.2 7.1-14.2	0.08-0.11 0.02-0.08 0.14-0.18 0.06-0.08	0.1-0.5 0.0-0.5 1.1-3.1 0.2-0.6	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3
Dalelake-----	0-4 4-59	95 95	3 3	1-3 1-3	1.70-1.80 1.70-1.80	7.1-14.2 7.1-14.2	0.05-0.08 0.05-0.08	0.1-0.2 0.1-0.2	0.0-0.5 0.0-0.3
Pintobasin, fine sandy loam----	0-2 2-4 4-24 24-59	75 91 84 85	18 6 13 12	5-10 2-6 1-6 1-6	1.45-1.55 1.60-1.70 1.55-1.65 1.60-1.70	2.8-7.8 7.1-14.2 7.1-14.2 7.1-14.2	0.12-0.15 0.04-0.07 0.08-0.11 0.06-0.08	0.3-0.8 0.1-0.4 0.0-0.5 0.0-0.5	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3

Soil Survey of Joshua Tree National Park, California

Table 19.-Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2065: Dalelake-----	0-4	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.5
	4-59	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
	0-2	55-75	26	8-15	1.45-1.55	14.2-19.8	0.09-0.13	0.0-0.3	0.0-0.5
	2-3	55-75	26	8-15	1.45-1.55	2.8-9.9	0.09-0.13	0.5-1.3	0.0-0.5
Aquapeak-----	3-11	45-75	13	8-18	1.50-1.60	1.0-9.9	0.09-0.15	0.4-1.5	0.0-0.3
	11-19	55-87	10	3-12	1.50-1.70	0.0-0.1	0.00-0.01	0.1-0.8	0.0-0.3
	19-33	72-87	10	3-11	1.60-1.70	7.1-14.2	0.04-0.06	0.1-0.9	0.0-0.3
	33-59	80-97	7	3-11	1.60-1.70	7.1-14.2	0.03-0.06	0.1-0.9	0.0-0.3
Coxpin-----	0-1	89-97	5	2-6	1.60-1.70	7.1-14.2	0.04-0.08	0.1-0.4	0.0-0.5
	1-10	55-95	17	4-12	1.50-1.60	2.8-9.9	0.09-0.11	0.3-1.1	0.0-0.3
	10-17	72-97	10	2-8	1.60-1.75	7.1-14.2	0.05-0.06	0.1-0.5	0.0-0.3
	17-22	87-97	7	1-6	1.65-1.75	0.0-0.1	0.00-0.01	0.0-0.3	0.0-0.0
2067: Aquapeak, overblown-----	22-59	89-97	8	1-6	1.65-1.75	7.1-14.2	0.05-0.07	0.0-0.4	0.0-0.0
	0-4	45-55	38	8-15	1.40-1.50	0.1-1.4	0.07-0.11	0.3-1.0	0.0-0.5
	4-9	45-75	33	10-20	1.45-1.55	0.1-1.4	0.13-0.17	0.8-2.0	0.0-0.3
	9-13	40-75	22	10-20	1.50-1.60	1.0-2.8	0.09-0.12	0.8-2.0	0.0-0.3
Buzzardsprings--	13-19	55-85	25	8-15	1.50-1.60	0.0-0.1	0.09-0.11	0.5-1.1	0.0-0.3
	19-43	80-97	16	3-10	1.60-1.70	7.1-14.2	0.04-0.07	0.2-0.7	0.0-0.3
	43-47	55-80	27	8-15	1.50-1.60	0.0-0.1	0.09-0.11	0.5-1.2	0.0-0.3
	47-59	80-97	7	3-8	1.65-1.75	7.1-14.2	0.04-0.07	0.2-0.7	0.0-0.3
Dalelake, thick sandy surface--	0-1	89-97	3	1-6	1.60-1.70	7.1-14.2	0.04-0.06	0.0-0.4	0.0-0.5
	1-3	78-97	6	1-10	1.60-1.75	7.1-14.2	0.05-0.11	0.1-0.9	0.0-0.3
	3-8	55-97	7	1-10	1.50-1.70	2.8-14.2	0.08-0.13	0.1-0.9	0.0-0.3
	8-23	55-97	4	1-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.5	0.0-0.3
Dalelake, thick sandy surface--	23-60	78-97	3	1-6	1.60-1.75	7.1-14.2	0.03-0.07	0.0-0.5	0.0-0.3
	0-2	97	2	1-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	2-13	97	2	1-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	13-22	97	2	1-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
Buzzardsprings, steep-----	22-59	97	2	1-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	0-1	78-87	13	5-8	1.55-1.65	7.1-14.2	0.05-0.06	0.3-0.6	0.0-0.5
	1-3	78-97	6	1-10	1.60-1.75	7.1-14.2	0.05-0.11	0.1-0.9	0.0-0.3
	3-8	55-97	7	1-10	1.50-1.70	2.8-14.2	0.08-0.13	0.1-0.9	0.0-0.3
Buzzardsprings, steep-----	8-23	55-97	4	1-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.5	0.0-0.3
	23-60	78-97	3	1-6	1.60-1.75	7.1-14.2	0.03-0.07	0.0-0.5	0.0-0.3

Soil Survey of Joshua Tree National Park, California

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2068:									
Aquapeak-----	0-0	87-97	7	3-6	1.60-1.70	7.1-14.2	0.03-0.04	0.1-0.3	0.0-0.5
	0-11	45-75	13	8-18	1.50-1.60	1.0-9.9	0.09-0.15	0.4-1.5	0.0-0.3
	11-19	55-87	10	3-12	1.50-1.70	0.0-0.1	0.00-0.01	0.1-0.8	0.0-0.3
	19-33	72-87	10	3-11	1.60-1.70	7.1-14.2	0.04-0.06	0.1-0.9	0.0-0.3
	33-59	80-97	7	3-11	1.60-1.70	7.1-14.2	0.03-0.06	0.1-0.9	0.0-0.3
Carpetflat, nongravelly surface-----	0-0	89-97	4	1-4	1.60-1.70	7.1-14.2	0.04-0.06	0.0-0.3	0.0-0.5
	0-4	55-78	20	8-12	1.50-1.60	2.8-9.9	0.08-0.10	0.4-0.8	0.0-0.3
	4-15	75-87	14	1-6	1.60-1.70	0.0-0.1	0.00-0.01	0.1-0.5	0.0-0.3
	15-61	87-97	4	1-6	1.60-1.70	7.1-14.2	0.04-0.06	0.0-0.2	0.0-0.3
Pintobasin-----	0-1	89	8	2-6	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.5	0.0-0.5
	1-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
2070:									
Missionsweet----	0-2	25-52	45	8-14	1.40-1.50	14.2-19.8	0.00-0.01	0.0-0.2	0.0-0.5
	2-3	40-52	45	8-14	1.40-1.50	0.1-1.4	0.08-0.10	0.3-0.8	0.0-0.5
	3-11	40-78	48	8-12	1.45-1.55	0.1-1.4	0.06-0.07	0.2-0.4	0.0-0.3
	11-17	40-78	37	8-12	1.50-1.60	2.8-9.9	0.05-0.07	0.1-0.6	0.0-0.3
	17-27	---	---	---	---	0.0-0.1	0.00-0.01	---	---
Carpetflat-----	0-2	20-53	55	10-20	1.35-1.55	14.2-19.8	0.07-0.16	0.0-0.5	0.0-0.5
	2-4	20-53	55	16-20	1.35-1.55	0.1-7.8	0.07-0.16	0.7-2.0	0.0-0.5
	4-7	40-78	15	8-12	1.45-1.60	0.1-9.9	0.05-0.09	0.3-0.9	0.0-0.3
	7-13	55-78	20	8-12	1.50-1.60	2.8-9.9	0.08-0.10	0.3-0.8	0.0-0.3
	13-16	75-87	14	1-6	1.60-1.70	0.0-0.1	0.00-0.01	0.1-0.5	0.0-0.3
	16-26	---	---	---	---	0.0-0.0	0.00-0.01	---	---
2075:									
Oldale-----	0-2	5-30	55	15-20	1.35-1.45	14.2-19.8	0.00-0.00	0.1-0.5	0.0-0.5
	2-3	5-30	55	15-20	1.35-1.45	0.1-1.4	0.08-0.11	0.6-1.3	0.0-0.5
	3-6	5-52	52	15-20	1.35-1.50	0.1-1.4	0.11-0.16	0.7-2.2	0.0-0.3
	6-15	25-52	35	16-25	1.45-1.55	0.1-1.4	0.06-0.07	0.3-1.8	0.0-0.3
	15-27	55-78	17	10-18	1.50-1.60	2.8-9.9	0.04-0.05	0.2-1.1	0.0-0.3
	27-59	80-97	14	2-8	1.55-1.75	7.1-14.2	0.03-0.05	0.1-0.5	0.0-0.3
Missionsweet----	0-2	25-52	45	8-14	1.40-1.50	14.2-19.8	0.00-0.01	0.0-0.2	0.0-0.5
	2-3	40-52	45	8-14	1.40-1.50	0.1-1.4	0.08-0.10	0.3-0.8	0.0-0.5
	3-11	40-78	48	8-12	1.45-1.55	0.1-1.4	0.06-0.07	0.2-0.4	0.0-0.3
	11-17	40-78	37	8-12	1.50-1.60	2.8-9.9	0.05-0.07	0.1-0.6	0.0-0.3
	17-27	---	---	---	---	0.0-0.1	0.00-0.01	---	---

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2076: Oldale-----	0-2	25-52	45	15-20	1.40-1.50	14.2-19.8	0.00-0.00	0.1-0.5	0.0-0.5
	2-4	25-52	45	15-20	1.40-1.50	0.1-1.4	0.05-0.06	0.4-0.9	0.0-0.5
	4-7	5-52	52	15-20	1.35-1.50	0.1-1.4	0.11-0.16	0.7-2.2	0.0-0.3
	7-16	25-52	35	16-25	1.45-1.55	0.1-1.4	0.06-0.07	0.3-1.8	0.0-0.3
	16-28	55-78	17	10-18	1.50-1.60	2.8-9.9	0.04-0.05	0.2-1.1	0.0-0.3
Carrizo-----	28-59	80-97	14	2-8	1.55-1.75	7.1-14.2	0.03-0.05	0.1-0.5	0.0-0.3
	0-1	76	15	2-10	1.45-1.55	1.4-10.6	0.05-0.09	0.0-0.6	0.0-0.5
	1-5	79	12	2-10	1.50-1.60	2.0-5.9	0.05-0.09	0.0-0.7	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	5.9-20.0	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	5.9-20.0	0.02-0.05	0.0-0.3	0.0-0.5
2077: Oldale-----	0-2	5-30	55	15-20	1.35-1.45	14.2-19.8	0.00-0.00	0.1-0.5	0.0-0.5
	2-3	5-30	55	15-20	1.35-1.45	0.1-1.4	0.08-0.11	0.6-1.3	0.0-0.5
	3-6	5-52	52	15-20	1.35-1.50	0.1-1.4	0.11-0.16	0.7-2.2	0.0-0.3
	6-9	25-52	35	16-25	1.45-1.55	0.1-1.4	0.06-0.07	0.3-1.8	0.0-0.3
	9-16	55-78	17	10-18	1.50-1.60	2.8-9.9	0.04-0.05	0.2-1.1	0.0-0.3
Carrizo-----	16-59	80-97	14	2-8	1.55-1.75	7.1-14.2	0.03-0.05	0.1-0.5	0.0-0.3
	0-1	55-78	17	5-10	1.45-1.55	2.8-9.9	0.11-0.13	0.3-0.8	0.0-0.5
	1-5	79	13	2-8	1.50-1.60	7.1-14.2	0.05-0.09	0.0-0.5	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	7.1-14.2	0.02-0.05	0.0-0.3	0.0-0.5
Carrizo, very rarely flooded-	0-1	76	15	2-10	1.45-1.55	2.8-9.9	0.05-0.09	0.0-0.6	0.0-0.5
	1-5	79	12	2-10	1.50-1.60	2.8-9.9	0.05-0.09	0.0-0.7	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	7.1-14.2	0.02-0.05	0.0-0.3	0.0-0.5
2085: Rainbowsend----	0-6	75-87	11	4-8	1.60-1.70	14.2-19.8	0.00-0.01	0.0-0.1	0.0-0.5
	6-7	75-87	11	4-8	1.60-1.70	7.1-14.2	0.04-0.05	0.1-0.4	0.0-0.5
	7-15	55-78	17	6-12	1.50-1.60	2.8-9.9	0.06-0.07	0.2-0.7	0.0-0.5
	15-18	55-78	17	8-12	1.50-1.60	2.8-9.9	0.05-0.09	0.3-0.7	0.0-0.5
	18-28	---	---	---	---	0.0-0.0	0.00-0.00	---	---
Goldenbell-----	0-2	55-78	30	10-18	1.45-1.55	14.2-19.8	0.00-0.01	0.0-0.2	0.0-0.5
	2-3	55-78	30	10-18	1.45-1.55	2.8-9.9	0.04-0.06	0.3-0.6	0.0-0.5
	3-11	30-65	20	15-22	1.45-1.55	0.1-7.8	0.06-0.11	0.6-1.8	0.0-0.3
	11-16	85-95	2	1-5	1.65-1.75	7.1-14.2	0.00-0.01	0.0-0.1	0.0-0.0
	16-59	90-98	2	1-3	1.65-1.75	7.1-14.2	0.02-0.03	0.0-0.1	0.0-0.0

Table 19.-Physical Soil Properties-Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2090: Deprave-----	0-2	35-52	39	12-18	1.40-1.50	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	2-4	35-52	39	12-18	1.40-1.50	0.1-1.4	0.10-0.13	0.7-1.1	0.0-0.5
	4-15	55-78	20	15-28	1.45-1.60	0.1-4.2	0.08-0.10	0.4-2.1	0.0-0.3
	15-39	75-92	12	1-5	1.55-1.75	2.8-14.2	0.02-0.07	0.0-0.2	0.0-0.3
	39-63	87-99	3	1-3	1.75-1.85	7.1-14.2	0.00-0.01	0.0-0.1	0.0-0.3
Rockhound-----	0-2	35-52	41	8-16	1.40-1.55	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	2-4	30-52	41	8-16	1.40-1.50	0.1-1.4	0.09-0.12	0.3-1.1	0.0-0.5
	4-7	30-70	34	15-20	1.45-1.55	0.1-7.8	0.06-0.09	0.4-1.2	0.0-0.3
	7-17	25-45	35	18-25	1.45-1.55	0.1-1.4	0.11-0.14	0.9-2.3	0.0-0.3
	17-34	40-75	17	18-26	1.45-1.55	0.1-4.2	0.05-0.06	0.6-2.0	0.0-0.3
	34-59	55-90	13	2-20	1.50-1.60	2.8-9.9	0.05-0.07	0.1-1.3	0.0-0.0
Rizzo-----	0-1	55-78	18	5-14	1.45-1.55	2.8-9.9	0.03-0.03	0.1-0.5	0.0-0.3
	1-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
2091: Deprave-----	0-1	35-52	39	12-18	1.40-1.50	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	1-2	35-52	39	12-18	1.40-1.50	0.1-1.4	0.10-0.13	0.7-1.1	0.0-0.5
	2-13	55-78	20	15-28	1.45-1.60	0.1-4.2	0.08-0.10	0.4-2.1	0.0-0.3
	13-24	75-92	12	1-5	1.55-1.75	2.8-14.2	0.02-0.07	0.0-0.2	0.0-0.3
	24-63	87-99	3	1-3	1.75-1.85	7.1-14.2	0.00-0.01	0.0-0.1	0.0-0.3
Roostertail-----	0-1	55-78	32	5-15	1.45-1.55	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.5
	1-2	55-78	32	5-15	1.45-1.55	2.8-9.9	0.07-0.08	0.2-0.8	0.0-0.5
	2-4	55-78	22	8-18	1.50-1.60	2.8-9.9	0.04-0.05	0.2-0.6	0.0-0.3
	4-29	55-78	22	8-18	1.50-1.60	2.8-9.9	0.06-0.08	0.3-1.0	0.0-0.3
	29-56	87-97	2	1-6	1.65-1.75	7.1-14.2	0.04-0.06	0.0-0.3	0.0-0.0
	56-60	---	---	---	---	0.0-0.1	0.00-0.01	---	---
	60-69	90-97	3	1-5	1.65-1.75	7.1-14.2	0.05-0.08	0.1-0.4	0.0-0.0
2100: Perurose-----	0-2	75-85	11	4-7	1.55-1.65	14.2-19.8	0.00-0.01	0.0-0.1	0.0-0.5
	2-3	75-85	11	4-7	1.55-1.65	7.1-14.2	0.07-0.10	0.3-0.3	0.0-0.5
	3-7	72-90	13	1-12	1.60-1.70	7.1-14.2	0.08-0.11	0.0-0.8	0.0-0.3
	7-18	72-90	13	1-12	1.60-1.70	7.1-14.2	0.06-0.08	0.0-0.8	0.0-0.3
	18-30	87-97	11	1-6	1.65-1.75	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
	30-43	87-97	8	1-6	1.50-1.70	0.0-0.1	0.01-0.02	0.1-0.2	0.0-0.3
	43-61	87-97	4	1-6	1.60-1.70	7.1-14.2	0.04-0.06	0.0-0.2	0.0-0.3
Coxpin-----	0-2	55-78	23	6-12	1.45-1.55	1.0-2.8	0.12-0.14	0.4-1.0	0.0-0.5
	2-10	55-95	16	4-12	1.60-1.70	7.1-14.2	0.09-0.11	0.3-1.1	0.0-0.3
	10-17	72-97	10	2-8	1.60-1.75	7.1-14.2	0.05-0.06	0.1-0.5	0.0-0.3
	17-22	87-97	7	1-6	1.65-1.75	0.0-0.1	0.00-0.01	0.0-0.3	0.0-0.0
	22-59	60-97	20	1-10	1.65-1.75	2.8-9.9	0.09-0.11	0.0-0.4	0.0-0.0

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2100: Pintobasin, gravelly surface-----	0-2	77	20	2-10	1.55-1.65	7.1-14.2	0.04-0.08	0.1-0.8	0.0-0.5
	2-14	85	13	2-6	1.60-1.75	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	14-35	95	4	1-6	1.60-1.75	7.1-14.2	0.03-0.08	0.0-0.5	0.0-0.3
	35-59	90	8	1-6	1.60-1.75	7.1-14.2	0.04-0.08	0.0-0.5	0.0-0.3
2101: Perurose, rarely flooded-----	0-1	87-97	4	1-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.3	0.0-0.5
	1-5	72-90	13	1-12	1.60-1.70	7.1-14.2	0.08-0.11	0.0-0.8	0.0-0.3
	5-16	72-90	13	1-12	1.60-1.70	7.1-14.2	0.06-0.08	0.0-0.8	0.0-0.3
	16-28	87-97	11	1-6	1.65-1.75	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
Pintobasin, rarely flooded-	28-41	87-97	8	1-6	1.50-1.70	0.0-0.1	0.01-0.02	0.1-0.2	0.0-0.3
	41-59	87-97	4	1-6	1.60-1.70	7.1-14.2	0.04-0.06	0.0-0.2	0.0-0.3
	0-2	95	3	2-8	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.6	0.0-0.5
	2-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
2110: Descent-----	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	0-2	79-85	9	3-8	1.60-1.70	14.2-19.8	0.07-0.09	0.0-0.1	0.0-0.5
	2-2	79-85	9	3-8	1.60-1.70	7.1-14.2	0.07-0.09	0.1-0.6	0.0-0.5
Descent, stable-	2-7	60-75	22	6-12	1.50-1.60	2.8-9.9	0.04-0.05	0.1-0.5	0.0-0.3
	7-17	79-85	15	2-8	1.60-1.70	7.1-14.2	0.03-0.04	0.0-0.3	0.0-0.3
	17-59	90-97	2	2-5	1.65-1.75	7.1-14.2	0.01-0.02	0.0-0.2	0.0-0.3
	0-0	55-70	33	8-12	1.50-1.60	14.2-19.8	0.00-0.01	0.0-0.2	0.0-0.5
2111: Descent, warm---	0-1	55-70	33	8-12	1.50-1.60	2.8-9.9	0.10-0.11	0.4-0.9	0.0-0.5
	1-7	60-75	22	6-12	1.50-1.60	2.8-9.9	0.04-0.05	0.1-0.5	0.0-0.3
	7-17	79-85	15	2-8	1.60-1.70	7.1-14.2	0.03-0.04	0.0-0.3	0.0-0.3
	17-59	90-97	2	2-5	1.65-1.75	7.1-14.2	0.01-0.02	0.0-0.2	0.0-0.3
Rubylee, very rarely flooded-	0-2	79-85	9	3-8	1.60-1.70	14.2-19.8	0.07-0.09	0.0-0.1	0.0-0.5
	2-2	79-85	9	3-8	1.60-1.70	7.1-14.2	0.07-0.09	0.1-0.6	0.0-0.5
	2-7	60-75	22	6-12	1.50-1.60	2.8-9.9	0.04-0.05	0.1-0.5	0.0-0.3
	7-17	79-85	15	2-8	1.60-1.70	7.1-14.2	0.03-0.04	0.0-0.3	0.0-0.3
Rubylee, very rarely flooded-	17-59	90-97	2	2-5	1.65-1.75	7.1-14.2	0.01-0.02	0.0-0.2	0.0-0.3
	0-2	55-78	7-37	8-15	1.45-1.55	2.8-9.9	0.13-0.15	0.6-1.5	0.0-0.5
	2-5	55-78	4-35	10-18	1.50-1.60	2.8-9.9	0.07-0.09	0.6-1.8	0.0-0.3
	5-18	55-78	4-35	10-18	1.50-1.60	2.8-9.9	0.08-0.10	0.6-1.8	0.0-0.3
18-59	72-93		4-25	3-16	1.50-1.70	2.8-14.2	0.04-0.08	0.1-1.6	0.0-0.3



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Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2120: Rizzo, rarely flooded-----	0-1	73-80	18	1-5	1.55-1.65	7.1-14.2	0.07-0.11	0.1-0.4	0.0-0.5
	1-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
Deprave-----	0-1	35-52	39	12-18	1.40-1.50	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	1-2	35-52	39	12-18	1.40-1.50	0.1-1.4	0.10-0.13	0.7-1.1	0.0-0.5
	2-13	55-78	20	15-28	1.45-1.60	0.1-4.2	0.08-0.10	0.4-2.1	0.0-0.3
	13-33	75-92	12	1-5	1.55-1.75	2.8-14.2	0.02-0.07	0.0-0.2	0.0-0.3
	33-63	87-99	3	1-3	1.75-1.85	7.1-14.2	0.00-0.01	0.0-0.1	0.0-0.3
Rizzo, frequently flooded-----	0-4	87-99	1	1-6	1.70-1.80	7.1-14.2	0.02-0.06	0.0-0.4	0.0-0.3
	4-12	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	12-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
2121: Rizzo, rubbly---	0-1	55-78	20	5-14	1.50-1.55	2.8-9.9	0.04-0.05	0.1-0.8	0.0-0.5
	1-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
2130: Goldenbell-----	0-2	35-52	49	12-18	1.40-1.45	14.2-19.8	0.00-0.01	0.0-0.2	0.0-0.5
	2-3	35-52	49	12-18	1.40-1.45	0.1-1.4	0.13-0.17	0.9-1.5	0.0-0.5
	3-11	30-52	40	15-22	1.45-1.55	0.1-7.8	0.06-0.11	0.6-1.8	0.0-0.3
	11-16	85-95	2	1-5	1.65-1.75	7.1-14.2	0.00-0.01	0.0-0.1	0.0-0.0
	16-59	90-98	2	1-3	1.65-1.75	7.1-14.2	0.02-0.03	0.0-0.1	0.0-0.0
Descent-----	0-1	79-85	10	3-8	1.60-1.70	7.1-14.2	0.10-0.12	0.2-0.6	0.0-0.5
	1-7	60-75	22	6-12	1.50-1.60	2.8-9.9	0.04-0.05	0.1-0.5	0.0-0.3
	7-17	79-85	15	2-8	1.60-1.70	7.1-14.2	0.03-0.04	0.0-0.3	0.0-0.3
	17-59	90-97	2	2-5	1.65-1.75	7.1-14.2	0.01-0.02	0.0-0.2	0.0-0.3
2140: Rockhound, cobbly-----	0-3	35-52	41	8-16	1.40-1.55	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	3-4	5-35	55	8-16	1.35-1.45	0.1-1.4	0.13-0.17	0.4-1.4	0.0-0.5
	4-34	55-75	15	12-19	1.50-1.60	2.8-9.9	0.07-0.09	0.6-1.6	0.0-0.3
	34-59	55-90	8	2-20	1.50-1.60	7.1-14.2	0.02-0.05	0.0-1.3	0.0-0.0
2402: Rizzo-----	0-2	75-87	13	2-6	1.65-1.75	7.1-14.2	0.04-0.06	0.1-0.4	0.0-0.5
	2-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2140: Rizzo, frequently flooded-----									
	0-1	87-99	1	1-6	1.70-1.80	7.1-14.2	0.01-0.02	0.0-0.2	0.0-0.5
	1-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
2403: Rizzo-----									
	0-1	55-78	30	6-14	1.45-1.55	2.8-9.9	0.08-0.09	0.2-0.8	0.0-0.5
	1-7	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	7-20	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	20-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
Rizzo, occasionally flooded-----									
	0-4	87-99	1	1-6	1.70-1.80	7.1-14.2	0.02-0.06	0.0-0.4	0.0-0.3
	4-12	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	12-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
2404: Rizzo, occasionally flooded-----									
	0-2	75-87	13	2-6	1.65-1.75	7.1-14.2	0.04-0.06	0.1-0.4	0.0-0.5
	2-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
Rizzo, very rarely flooded-									
	0-1	73-80	18	1-5	1.55-1.65	7.1-14.2	0.07-0.11	0.1-0.4	0.0-0.5
	1-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
2405: Carrizo, rarely flooded-----									
	0-1	72-87	15	5-10	1.55-1.65	7.1-14.2	0.04-0.06	0.2-0.7	0.0-0.5
	1-5	90	6	2-8	1.50-1.60	7.1-14.2	0.05-0.09	0.1-0.6	0.0-0.5
	5-59	95	1	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.1-0.3	0.0-0.5
Carrizo, occasionally flooded-----									
	0-1	87	9	3-8	1.45-1.55	7.1-14.2	0.05-0.09	0.0-0.5	0.0-0.5
	1-5	97	1	2-8	1.50-1.60	7.1-14.2	0.05-0.09	0.0-0.6	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
	13-59	96	2	2-6	1.60-1.70	7.1-14.2	0.02-0.05	0.0-0.3	0.0-0.5

Soil Survey of Joshua Tree National Park, California

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2406: Pintobasin, frequently flooded-----									
	0-3	95	3	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.5
	3-19	95	3	2-6	1.60-1.70	7.1-14.2	0.03-0.06	0.1-0.4	0.0-0.3
	19-59	97	2	1-6	1.60-1.70	7.1-14.2	0.04-0.07	0.0-0.4	0.0-0.3
Carrizo, occasionally flooded-----									
	0-1	87	9	3-8	1.45-1.55	7.1-14.2	0.05-0.09	0.0-0.5	0.0-0.5
	1-5	97	1	2-8	1.50-1.60	7.1-14.2	0.05-0.09	0.0-0.6	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
2407: Pintobasin, rarely flooded-									
	0-2	89	8	2-10	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.7	0.0-0.5
	2-4	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.4	0.0-0.3
	4-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
Carrizo, occasionally flooded-----									
	0-1	87	9	3-8	1.45-1.55	7.1-14.2	0.05-0.09	0.0-0.5	0.0-0.5
	1-5	97	1	2-8	1.50-1.60	7.1-14.2	0.05-0.09	0.0-0.6	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
Carrizo, frequently flooded-----									
	0-1	89-97	2-10	1-6	1.60-1.70	7.1-14.2	0.05-0.08	0.0-0.5	0.0-0.3
	1-5	97	1	2-8	1.50-1.60	7.1-14.2	0.05-0.09	0.0-0.6	0.0-0.5
	5-13	92	4	2-6	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.5
2408: Rizzo, frequently flooded-----									
	0-4	87-99	1	1-6	1.70-1.80	7.1-14.2	0.02-0.06	0.0-0.4	0.0-0.3
	4-12	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	12-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
Rizzo, very rarely flooded-									
	0-2	75-87	13	2-6	1.65-1.75	7.1-14.2	0.04-0.06	0.1-0.4	0.0-0.5
	2-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2409: Rizzo, frequently flooded-----	0-1 1-4 4-12 12-59	75-87 87-99 75-87 87-99	13 1 14 4	1-6 1-6 1-6 1-6	1.55-1.65 1.70-1.80 1.60-1.85 1.60-1.85	7.1-14.2 7.1-14.2 7.1-14.2 7.1-14.2	0.06-0.08 0.02-0.06 0.03-0.05 0.02-0.04	0.0-0.4 0.0-0.4 0.0-0.4 0.0-0.3	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.0
Chemwash, frequently flooded-----	0-2 2-67	92 92	6 4	1-8 1-6	1.70-1.80 1.45-1.65	7.1-14.2 7.1-14.2	0.02-0.05 0.02-0.05	0.0-0.4 0.0-0.3	0.0-0.5 0.0-0.5
Carsitas, occasionally flooded, braided-----	0-1 1-59	80-87 87-97	13 8	2-7 1-4	1.60-1.70 1.65-1.75	7.1-14.2 7.1-14.2	0.04-0.06 0.04-0.06	0.0-0.6 0.0-0.4	0.0-0.3 0.0-0.3
2420: Carsitas, frequently flooded-----	0-1 1-59	88-97 87-97	7 8	2-5 1-4	1.60-1.70 1.65-1.75	7.1-14.2 7.1-14.2	0.04-0.07 0.04-0.06	0.1-0.3 0.0-0.4	0.0-0.5 0.0-0.3
Carsitas, occasionally flooded-----	0-1 1-59	88-97 87-97	7 8	2-5 1-4	1.60-1.70 1.65-1.75	7.1-14.2 7.1-14.2	0.04-0.07 0.04-0.06	0.1-0.3 0.0-0.4	0.0-0.5 0.0-0.3
Carsitas, rarely flooded-----	0-1 1-59	55-78 87-97	18 8	5-7 1-4	1.45-1.55 1.65-1.75	2.8-9.9 7.1-14.2	0.10-0.12 0.04-0.06	0.3-0.6 0.0-0.4	0.0-0.5 0.0-0.3
2421: Carsitas, very rarely flooded-	0-1 1-59	80 87-97	16 8	1-7 1-4	1.55-1.65 1.65-1.75	7.1-14.2 7.1-14.2	0.05-0.07 0.04-0.06	0.0-0.6 0.0-0.4	0.0-0.5 0.0-0.3
Carsitas, rarely flooded-----	0-1 1-59	55-78 87-97	18 8	5-7 1-4	1.45-1.55 1.65-1.75	2.8-9.9 7.1-14.2	0.10-0.12 0.04-0.06	0.3-0.6 0.0-0.4	0.0-0.5 0.0-0.3
2431: Chemwash, frequently flooded, braided-----	0-2 2-67	92 92	6 4	1-8 1-6	1.70-1.80 1.45-1.65	7.1-14.2 7.1-14.2	0.02-0.05 0.02-0.05	0.0-0.4 0.0-2.9	0.0-0.5 0.0-0.5

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2431: Chemwash, frequently flooded-----	0-2	92	6	1-8	1.70-1.80	7.1-14.2	0.02-0.05	0.0-0.4	0.0-0.5
	2-67	92	4	1-6	1.45-1.65	7.1-14.2	0.02-0.05	0.0-2.9	0.0-0.5
2440: Rizzo-----	0-1	75-87	13	1-6	1.55-1.65	7.1-14.2	0.06-0.08	0.0-0.4	0.0-0.5
	1-4	87-99	1	1-6	1.70-1.80	7.1-14.2	0.02-0.06	0.0-0.4	0.0-0.3
	4-12	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	12-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
Rizzo, occasionally flooded-----	0-1	87-99	1	1-6	1.70-1.80	7.1-14.2	0.01-0.02	0.0-0.2	0.0-0.5
	1-4	87-99	1	1-6	1.70-1.80	7.1-14.2	0.02-0.06	0.0-0.4	0.0-0.3
	4-12	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	12-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
Rizzo, extremely stony-----	0-1	55-78	18	5-14	1.45-1.55	2.8-9.9	0.03-0.03	0.1-0.5	0.0-0.3
	1-9	75-87	11	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	9-19	75-87	14	1-6	1.60-1.85	7.1-14.2	0.03-0.05	0.0-0.4	0.0-0.3
	19-59	87-99	4	1-6	1.60-1.85	7.1-14.2	0.02-0.04	0.0-0.3	0.0-0.0
2715: Dalelake-----	0-2	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.5
	2-59	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
Sheephole-----	0-1	88-97	1	1-5	1.60-1.70	7.1-14.2	0.05-0.08	0.0-0.4	0.0-0.5
	1-6	88-97	1	1-5	1.65-1.75	7.1-14.2	0.05-0.08	0.1-0.4	0.0-0.3
	6-22	88-97	1	1-5	1.65-1.75	7.1-14.2	0.05-0.08	0.0-0.4	0.0-0.3
	22-29	88-97	1	1-5	1.65-1.75	7.1-14.2	0.05-0.08	0.0-0.4	0.0-0.3
	29-42	88-97	1	1-5	1.60-1.70	7.1-14.2	0.02-0.03	0.0-0.2	0.0-0.0
	42-59	88-97	1	1-5	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.4	0.0-0.3
Pintobasin-----	0-1	89	8	2-6	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.5	0.0-0.5
	1-8	91	6	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.5	0.0-0.3
	8-24	91	6	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
	24-59	93	4	1-6	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.5	0.0-0.3
2716: Dalelake, steep-	0-4	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.5
	4-59	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
Dalelake-----	0-4	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.5
	4-59	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3

Soil Survey of Joshua Tree National Park, California

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2717: Dalelake-----	0-4	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.5
	4-59	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
Buzzardsprings, fine sand-----	0-2	75-87	21	2-6	1.55-1.65	7.1-14.2	0.07-0.10	0.1-0.5	0.0-0.5
	2-3	78-97	6	1-10	1.60-1.75	7.1-14.2	0.05-0.11	0.1-0.9	0.0-0.3
	3-8	55-97	7	1-10	1.50-1.70	2.8-14.2	0.08-0.13	0.1-0.9	0.0-0.3
	8-23	55-97	4	1-6	1.60-1.70	5.9-20.0	0.05-0.08	0.1-0.5	0.0-0.3
	23-60	78-97	3	1-6	1.60-1.75	7.1-14.2	0.03-0.07	0.0-0.5	0.0-0.3
2718: Dalelake-----	0-4	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.5
	4-59	95	3	1-3	1.70-1.80	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
Sheephole, gravelly surface-----	0-1	88-97	1	1-5	1.60-1.70	7.1-14.2	0.05-0.08	0.0-0.4	0.0-0.5
	1-6	88-97	1	1-5	1.65-1.75	7.1-14.2	0.05-0.08	0.1-0.4	0.0-0.3
	6-22	88-97	1	1-5	1.65-1.75	7.1-14.2	0.05-0.08	0.0-0.4	0.0-0.3
	22-29	88-97	1	1-5	1.65-1.75	7.1-14.2	0.05-0.08	0.0-0.4	0.0-0.3
	29-42	88-97	1	1-5	1.60-1.70	7.1-14.2	0.02-0.03	0.0-0.2	0.0-0.0
	42-59	88-97	1	1-5	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.4	0.0-0.3
2820: Impedimenta----	0-1	80-87	11	3-6	1.55-1.65	7.1-14.2	0.05-0.06	0.1-0.4	0.0-0.5
	1-4	80-97	4	2-4	1.55-1.70	7.1-14.2	0.04-0.06	0.1-0.2	0.0-0.3
	4-14	---	---	---	---	0.0-0.1	0.00-0.01	---	---
2825: Supplymine-----	0-6	75-87	10	2-8	1.55-1.65	14.2-19.8	0.00-0.01	0.0-0.1	0.0-0.5
	6-7	75-87	10	2-8	1.55-1.65	7.1-14.2	0.05-0.07	0.1-0.5	0.0-0.5
	7-20	55-78	16	6-12	1.50-1.60	2.8-9.9	0.04-0.10	0.1-0.7	0.0-0.3
	20-33	55-78	22	6-18	1.50-1.60	1.0-9.9	0.04-0.10	0.1-1.1	0.0-0.3
	33-43	---	---	---	---	0.0-0.0	0.00-0.01	---	---
Bolero, dry-----	0-6	77-87	10	2-6	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.5
	6-7	77-87	10	2-6	1.55-1.65	7.1-14.2	0.03-0.04	0.0-0.2	0.0-0.5
	7-12	77-87	13	4-10	1.60-1.70	7.1-14.2	0.05-0.07	0.1-0.5	0.0-0.3
	12-15	77-87	11	4-10	1.60-1.70	7.1-14.2	0.04-0.06	0.1-0.5	0.0-0.3
	15-19	77-87	11	4-10	1.60-1.70	7.1-14.2	0.00-0.01	0.0-0.2	0.0-0.3
	19-29	---	---	---	---	0.0-0.0	0.00-0.01	---	---
Ironage-----	0-6	55-78	17	6-10	1.45-1.55	14.2-19.8	0.00-0.01	0.0-0.1	0.0-0.5
	6-9	55-78	17	6-10	1.45-1.55	2.8-9.9	0.08-0.09	0.2-0.6	0.0-0.5
	9-13	45-78	25	8-18	1.50-1.60	2.8-9.9	0.08-0.09	0.2-1.0	0.0-0.3
	13-18	45-78	21	8-18	1.45-1.60	0.1-9.9	0.05-0.06	0.2-0.9	0.0-0.1
	18-24	45-78	19	8-18	1.50-1.60	2.8-9.9	0.04-0.05	0.2-0.9	0.0-0.1
	24-33	---	---	---	---	0.0-0.1	0.00-0.00	---	---

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
2830: Blackeagle, cool	0-8	75-80	19	6-9	1.50-1.60	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	8-9	75-80	19	6-9	1.50-1.60	2.8-9.9	0.03-0.05	0.2-0.5	0.0-0.5
	9-16	56-75	15	8-18	1.50-1.60	2.8-9.9	0.04-0.07	0.2-1.1	0.0-0.3
	16-30	---	---	---	---	0.0-0.1	0.00-0.00	---	---
2835: Blackeagle-----	0-5	56-75	19	6-12	1.45-1.55	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	5-7	56-75	17	8-12	1.45-1.55	2.8-9.9	0.07-0.10	0.3-0.7	0.0-0.5
	7-17	56-75	24	8-18	1.45-1.55	2.8-9.9	0.07-0.10	0.2-1.1	0.0-0.3
	17-27	---	---	---	---	0.0-0.1	0.00-0.00	---	---
2840: Jadestorm-----	0-2	70-80	22	6-12	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	2-3	70-80	22	6-12	1.55-1.65	7.1-14.2	0.02-0.05	0.2-0.8	0.0-0.5
	3-10	48-85	8	6-16	1.45-1.55	0.1-9.9	0.04-0.11	0.1-1.0	0.0-0.3
	10-17	---	---	0-0	---	0.1-1.4	0.00-0.01	---	0.0-0.0
3110: Coppermine, cool	17-26	---	---	---	---	0.0-0.0	0.00-0.00	---	---
	0-1	55-78	17	6-12	1.45-1.55	2.8-9.9	0.09-0.11	0.4-1.1	0.0-0.5
	1-4	55-87	19	4-12	1.50-1.70	2.8-9.9	0.05-0.10	0.2-1.0	0.0-0.3
	4-8	55-78	23	12-20	1.50-1.60	1.0-2.8	0.06-0.08	0.4-1.5	0.0-0.3
Stranger-----	8-11	40-75	18	20-22	1.45-1.55	0.1-4.2	0.04-0.05	0.5-1.0	0.0-0.3
	11-20	---	---	---	---	0.1-1.4	0.00-0.00	---	---
	0-1	78-87	13	1-8	1.55-1.65	7.1-14.2	0.06-0.09	0.0-0.6	0.0-0.5
	1-3	75-97	4	1-5	1.55-1.70	7.1-14.2	0.05-0.08	0.0-0.3	0.0-0.0
3120: Aguilareal-----	3-13	---	---	---	---	0.0-0.1	0.00-0.00	---	---
	0-3	75-80	13	4-8	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.5
	3-4	75-87	7-21	4-8	1.55-1.65	7.1-14.2	0.01-0.05	0.0-3.0	0.0-0.5
	4-14	55-78	4-37	8-18	1.50-1.60	2.8-9.9	0.06-0.08	0.0-3.0	0.0-0.3
Blackeagle-----	14-19	55-78	4-37	8-18	1.50-1.60	2.8-9.9	0.06-0.08	0.0-3.0	0.0-0.3
	19-29	---	---	---	---	0.0-0.0	0.00-0.00	---	---
	0-5	56-75	19	6-12	1.45-1.55	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	5-7	56-75	17	8-12	1.45-1.55	2.8-9.9	0.07-0.10	0.3-0.7	0.0-0.5
3213: Dalvord-----	7-17	56-75	24	8-18	1.45-1.55	2.8-9.9	0.07-0.10	0.2-1.1	0.0-0.3
	17-27	---	---	---	---	0.0-0.1	0.00-0.00	---	---
	0-2	85	10	5-15	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.2	0.0-0.5
	2-3	85	10	5-15	1.55-1.65	7.1-14.2	0.06-0.10	0.3-1.3	0.0-0.5
	3-5	75	17	8-15	1.50-1.60	2.8-9.9	0.13-0.15	0.6-1.4	0.0-0.5
	5-14	55	31	8-15	1.50-1.60	2.8-9.9	0.02-0.05	0.1-0.6	0.0-0.5
	14-24	---	---	---	---	0.0-0.0	0.00-0.00	---	---

Soil Survey of Joshua Tree National Park, California

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
3213: Aguilareal-----	0-3	75-80	13	4-8	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.5
	3-5	75-80	13-21	4-8	1.55-1.65	7.1-14.2	0.05-0.06	0.2-0.5	0.0-0.5
	5-14	55-78	4-37	8-18	1.50-1.60	2.8-9.9	0.06-0.08	0.2-1.1	0.0-0.3
	14-19	55-78	4-37	8-18	1.50-1.60	2.8-9.9	0.06-0.08	0.2-1.1	0.0-0.3
	19-29	---	---	---	---	0.0-0.0	0.00-0.00	---	---
3242: Langwell-----	0-1	78	14	8-15	1.45-1.55	2.8-9.9	0.08-0.12	0.5-1.1	0.0-0.5
	1-4	78	12	8-15	1.50-1.60	2.8-9.9	0.08-0.12	0.5-1.3	0.0-0.5
	4-14	---	---	---	---	0.0-0.0	0.00-0.00	---	---
Helendale, cool-	0-10	78-87	15	4-8	1.55-1.65	7.1-14.2	0.05-0.08	0.3-0.7	0.0-0.5
	10-37	50-75	17	8-18	1.50-1.60	1.4-9.9	0.09-0.12	0.6-1.8	0.0-0.3
	37-59	55-75	17	8-18	1.50-1.60	2.8-9.9	0.09-0.12	0.6-1.8	0.0-0.3
3285: Pinecity-----	0-1	85	10	3-8	1.55-1.65	5.9-20.0	0.05-0.08	0.1-0.6	0.0-0.3
	1-7	80	14	3-8	1.55-1.65	5.9-20.0	0.05-0.08	0.1-0.6	0.0-0.3
	7-59	---	---	---	---	0.0-0.0	0.00-0.01	---	---
Contactmine-----	0-1	70-72	10-22	6-18	1.45-1.55	1.0-2.8	0.09-0.12	0.4-1.8	0.0-0.5
	1-5	65-75	7-18	7-18	1.45-1.55	1.0-2.8	0.09-0.12	0.3-1.7	0.0-0.3
	5-9	30-65	5-53	17-30	1.45-1.55	0.1-4.2	0.11-0.15	0.9-3.9	0.0-0.3
	9-22	35-65	17-47	18-28	1.45-1.55	0.1-1.4	0.10-0.14	1.1-3.1	0.0-0.3
	22-26	50-70	14-28	16-22	1.45-1.55	0.1-1.4	0.10-0.14	0.4-2.2	0.0-0.3
	26-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Desertqueen-----	0-4	60-75	15-36	6-10	1.50-1.60	2.8-9.9	0.09-0.12	0.4-0.9	0.0-0.5
	4-11	55-75	15-27	10-18	1.50-1.60	2.8-9.9	0.08-0.12	0.5-1.7	0.0-0.3
	11-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
3286: Pinecity, gravelly loamy sand-----	0-2	79	16	3-8	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.6	0.0-0.3
	2-4	79	16	3-8	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.6	0.0-0.3
	4-59	---	---	---	---	0.0-0.1	0.00-0.01	---	---
3291: Smithcanyon-----	0-3	80-88	6-18	2-6	1.60-1.70	7.1-14.2	0.06-0.10	0.1-0.4	0.3-1.0
	3-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Stubbespring----	0-1	90-95	2-7	3-5	1.75-1.85	7.1-14.2	0.03-0.07	0.2-0.4	0.0-1.0
	1-4	70-88	8-16	4-14	1.60-1.70	7.1-14.2	0.05-0.08	0.3-1.3	0.0-1.0
	4-13	45-75	18-47	8-17	1.50-1.60	2.8-9.9	0.07-0.12	0.5-1.7	0.0-0.5
	13-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---



## Soil Survey of Joshua Tree National Park, California

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
3292: Smithcanyon-----	0-2 2-7 7-59	85 85 ---	10 9 ---	2-6 2-6 ---	1.55-1.65 1.60-1.70 ---	7.1-14.2 7.1-14.2 0.1-1.4	0.05-0.08 0.04-0.07 0.00-0.01	0.1-0.4 0.1-0.5 ---	0.0-1.0 0.0-0.8 ---
Pinecity-----	0-2 2-7 7-59	85 85 ---	12 12 ---	2-9 2-9 ---	1.55-1.65 1.55-1.65 ---	7.1-14.2 7.1-14.2 0.0-0.1	0.04-0.08 0.04-0.08 0.00-0.01	0.1-0.7 0.1-0.8 ---	0.0-0.5 0.0-0.5 ---
3293: Smithcanyon-----	0-1 1-7 7-59	90 85 ---	7 11 ---	2-6 2-6 ---	1.60-1.70 1.60-1.70 ---	7.1-14.2 7.1-14.2 0.1-1.4	0.04-0.08 0.04-0.07 0.00-0.01	0.1-0.4 0.1-0.5 ---	0.0-1.0 0.0-0.8 ---
Pinecity-----	0-2 2-7 7-59	85 85 ---	12 12 ---	2-9 2-9 ---	1.55-1.65 1.55-1.65 ---	7.1-14.2 7.1-14.2 0.1-1.4	0.04-0.08 0.04-0.08 0.00-0.01	0.1-0.7 0.1-0.8 ---	0.0-0.5 0.0-0.5 ---
3294: Smithcanyon, dry	0-1 1-9 9-59	90 85 ---	7 11 ---	2-6 2-6 ---	1.60-1.70 1.60-1.70 ---	7.1-14.2 7.1-14.2 0.1-1.4	0.04-0.08 0.04-0.08 0.00-0.01	0.1-0.4 0.1-0.5 ---	0.0-1.0 0.0-1.0 ---
3295: Desertqueen, dry	0-4 4-11 11-59	60-75 55-75 ---	15-36 15-27 ---	6-10 10-18 ---	1.50-1.60 1.50-1.60 ---	2.8-9.9 2.8-9.9 0.1-1.4	0.09-0.12 0.08-0.12 0.00-0.01	0.4-0.9 0.5-1.7 ---	0.0-0.5 0.0-0.3 ---
Hexie-----	0-1 1-5 5-9 9-39 39-59	70 70 65 75 ---	20 20 21 16 ---	6-10 6-10 12-18 8-18 ---	1.50-1.60 1.50-1.60 1.50-1.60 1.50-1.60 ---	2.8-9.9 2.8-9.9 2.8-9.9 2.8-9.9 0.1-1.4	0.07-0.10 0.05-0.09 0.05-0.09 0.06-0.10 0.00-0.01	0.2-0.6 0.4-0.8 0.7-1.6 0.2-0.7 ---	0.0-0.5 0.0-0.3 0.0-0.3 0.0-0.3 ---
3296: Desertqueen-----	0-2 2-5 5-13 13-59	90-95 80-85 60-75 ---	1-8 11-16 15-22 ---	2-4 4-8 10-15 ---	1.60-1.70 1.60-1.70 1.50-1.60 ---	7.1-14.2 7.1-14.2 2.8-9.9 0.1-1.4	0.04-0.07 0.04-0.07 0.07-0.11 0.00-0.01	0.1-0.3 0.2-0.6 0.6-1.3 ---	0.0-0.5 0.0-0.3 0.0-0.3 ---
Pinecity-----	0-2 2-6 6-59	93 91 ---	5 6 ---	2-9 1-8 ---	1.65-1.75 1.55-1.65 ---	7.1-14.2 7.1-14.2 0.0-0.1	0.05-0.08 0.06-0.08 0.00-0.01	0.1-0.8 0.0-0.6 ---	0.0-0.5 0.0-0.3 ---
3297: Desertqueen, warm-----	0-2 2-5 5-59	60-75 55-75 ---	15-36 15-27 ---	6-10 10-18 ---	1.50-1.60 1.50-1.60 ---	2.8-9.9 2.8-9.9 0.1-1.4	0.09-0.12 0.08-0.12 0.00-0.01	0.4-0.9 0.5-1.7 ---	0.0-0.5 0.0-0.3 ---

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
3297: Contactmine, dry	0-2	70-72	10-22	6-18	1.45-1.55	2.8-9.9	0.08-0.12	0.4-1.6	0.0-0.5
	2-5	65-75	7-18	7-18	1.50-1.60	2.8-9.9	0.08-0.12	0.3-1.7	0.0-0.3
	5-12	30-65	5-53	17-30	1.40-1.50	0.0-0.1	0.11-0.15	0.9-4.0	0.0-0.3
	12-22	35-65	17-47	18-28	1.40-1.50	0.0-0.1	0.10-0.14	1.1-3.1	0.0-0.3
	22-47	60-75	13-32	8-18	1.50-1.60	2.8-9.9	0.08-0.12	0.5-1.5	0.0-0.3
	47-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Seanna, dry-----	0-1	70	21	8-18	1.45-1.55	2.8-9.9	0.08-0.11	0.4-1.6	0.0-0.5
	1-8	70	22	8-18	1.50-1.60	2.8-9.9	0.04-0.13	0.2-1.6	0.0-0.5
	8-15	55	34	8-18	1.50-1.60	2.8-9.9	0.09-0.12	0.3-1.6	0.0-0.3
	15-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
3325: Ironped, warm---	0-2	92	5	3-8	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.6	0.0-0.3
	2-7	94	4	2-8	1.55-1.75	7.1-14.2	0.04-0.08	0.1-0.6	0.0-0.3
	7-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Hexie-----	0-3	70	20	6-10	1.50-1.60	2.8-9.9	0.07-0.10	0.3-0.8	0.0-0.5
	3-13	65	21	12-18	1.50-1.60	2.8-9.9	0.05-0.09	0.7-1.5	0.0-0.3
	13-35	75	16	8-18	1.50-1.60	2.8-9.9	0.06-0.10	0.5-1.6	0.0-0.3
	35-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Ironped-----	0-2	92	5	3-8	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.6	0.0-0.3
	2-7	94	4	2-8	1.55-1.75	7.1-14.2	0.04-0.08	0.1-0.6	0.0-0.3
	7-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
3335: Xeric Torriorthents--	0-9	85	12	1-17	1.55-1.65	7.1-14.2	0.04-0.07	0.0-1.4	0.0-1.0
	9-26	82	15	1-12	1.60-1.70	7.1-14.2	0.02-0.07	0.0-0.8	0.0-0.8
	26-36	85	13	1-12	1.60-1.70	7.1-14.2	0.02-0.06	0.0-0.8	0.0-0.8
	36-50	90	9	1-12	1.60-1.70	7.1-14.2	0.01-0.07	0.0-0.8	0.0-0.8
	50-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Xeric Torriorthents, warm-----	0-9	85	12	1-17	1.55-1.65	7.1-14.2	0.04-0.07	0.0-1.4	0.0-1.0
	9-26	82	15	1-12	1.60-1.70	7.1-14.2	0.02-0.07	0.0-0.8	0.0-0.8
	26-36	85	13	1-12	1.60-1.70	7.1-14.2	0.02-0.06	0.0-0.8	0.0-0.8
	36-50	90	9	1-12	1.60-1.70	7.1-14.2	0.01-0.07	0.0-0.8	0.0-0.8
	50-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
3336: Xeric Torriorthents--	0-9	85	12	1-17	1.55-1.65	7.1-14.2	0.04-0.07	0.0-1.4	0.0-1.0
	9-26	82	15	1-12	1.60-1.70	7.1-14.2	0.02-0.07	0.0-0.8	0.0-0.8
	26-36	85	13	1-12	1.60-1.70	7.1-14.2	0.02-0.06	0.0-0.8	0.0-0.8
	36-50	90	9	1-12	1.60-1.70	7.1-14.2	0.01-0.07	0.0-0.8	0.0-0.8
	50-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
3336: Bigbernie-----	0-1	85	12	2-5	1.55-1.65	7.1-14.2	0.05-0.06	0.1-0.3	0.0-0.5
	1-4	80	16	2-5	1.60-1.70	7.1-14.2	0.03-0.04	0.0-0.3	0.0-0.3
	4-24	90	8	1-4	1.65-1.75	7.1-14.2	0.02-0.04	0.0-0.2	0.0-0.3
	24-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
3340: Seanna-----	0-1	72	22	6-14	1.45-1.55	2.8-9.9	0.08-0.11	0.4-1.4	0.0-0.5
	1-6	70	22	8-18	1.50-1.60	2.8-9.9	0.04-0.13	0.2-1.6	0.0-0.3
	6-17	60	31	8-18	1.50-1.60	2.8-9.9	0.07-0.10	0.3-1.6	0.0-0.3
	17-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Grubstake, moist	0-2	55-75	18	6-10	1.45-1.55	14.2-19.8	0.00-0.01	0.0-0.2	0.0-0.5
	2-3	55-75	18	6-10	1.45-1.55	2.8-9.9	0.09-0.11	0.0-0.2	0.0-0.3
	3-18	55-75	22	8-15	1.50-1.60	2.8-9.9	0.09-0.14	0.4-1.3	0.0-0.3
	18-30	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Pinecity-----	30-39	---	---	---	---	0.0-0.0	0.00-0.00	---	---
	0-2	80	14	5-9	1.55-1.65	0.1-14.2	0.05-0.07	0.2-0.7	0.0-1.0
	2-9	82	13	5-8	1.60-1.70	0.1-14.2	0.05-0.07	0.2-0.6	0.0-0.5
	9-59	---	---	---	---	0.0-0.1	0.00-0.10	---	---
3345: Bigcanyon-----	0-0	97	2	1-5	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.4	0.0-0.5
	0-14	96	3	1-4	1.75-1.85	7.1-14.2	0.03-0.07	0.0-0.3	0.0-0.3
	14-20	94	5	1-4	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.3	0.0-0.3
	20-59	---	---	---	---	0.7-7.1	0.00-0.01	---	---
Bigcanyon, cool-	0-1	90	9	1-5	1.60-1.70	7.1-14.2	0.04-0.07	0.0-0.4	0.0-0.5
	1-9	90	9	1-4	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.3	0.0-0.3
	9-23	90	8	1-4	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.3	0.0-0.3
	23-59	---	---	---	---	0.7-7.1	0.00-0.01	---	---
3440: Pacific Mesa, steep-----	0-3	55-78	37	6-8	1.50-1.60	2.8-9.9	0.07-0.09	0.3-0.6	0.0-0.5
	3-9	55-78	35	6-12	1.50-1.60	2.8-9.9	0.06-0.08	0.2-0.7	0.0-0.3
	9-16	55-78	39	6-10	1.50-1.60	2.8-9.9	0.04-0.05	0.1-0.4	0.0-0.3
	16-26	---	---	---	---	0.0-0.0	0.00-0.01	---	---
Pacific Mesa----	0-0	5-35	57	6-8	1.35-1.45	0.1-1.4	0.14-0.18	0.4-0.7	0.0-0.5
	0-2	5-35	58	6-8	1.45-1.55	0.1-1.4	0.14-0.18	0.4-0.7	0.0-0.5
	2-9	55-78	35	6-12	1.50-1.60	2.8-9.9	0.06-0.08	0.2-0.7	0.0-0.3
	9-17	55-78	39	6-10	1.50-1.60	2.8-9.9	0.04-0.05	0.1-0.4	0.0-0.3
	17-26	---	---	---	---	0.0-0.0	0.00-0.01	---	---

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Table 19.-Physical Soil Properties-Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
3509: Cajon, very rarely flooded-	0-1	89-95	3-5	2-6	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.5	0.0-0.5
	1-19	70-85	10-26	1-5	1.55-1.65	7.1-14.2	0.05-0.08	0.0-0.4	0.0-0.3
	19-38	80-85	11-16	1-4	1.60-1.70	7.1-14.2	0.04-0.07	0.0-0.3	0.0-0.3
	38-59	85-95	4-14	1-5	1.60-1.70	7.1-14.2	0.02-0.07	0.0-0.3	0.0-0.3
Friedliver-----	0-1	84-85	9-10	5-7	1.55-1.65	7.1-14.2	0.04-0.08	0.2-0.4	0.0-0.5
	1-16	80-85	10-14	5-6	1.55-1.65	7.1-14.2	0.04-0.08	0.2-0.5	0.0-0.3
	16-33	55-75	9-34	11-16	1.45-1.55	2.8-9.9	0.14-0.18	0.7-1.2	0.0-0.3
	33-59	55-75	12-24	13-21	1.50-1.60	1.0-2.8	0.09-0.13	0.8-1.6	0.0-0.3
3525: Cajon-----	0-1	90-97	1-7	1-7	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.5	0.0-0.5
	1-4	89-96	2-8	2-4	1.60-1.70	7.1-14.2	0.04-0.08	0.1-0.3	0.0-0.3
	4-20	87-97	2-8	1-4	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.3	0.0-0.3
	20-59	91-97	2-8	1-4	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.3	0.0-0.3
Friedliver-----	0-1	93	4	2-6	1.60-1.70	7.1-14.2	0.04-0.06	0.1-0.5	0.0-0.5
	1-5	95	3	2-8	1.60-1.70	7.1-14.2	0.02-0.06	0.1-0.6	0.0-0.5
	5-16	95	2	3-8	1.60-1.70	7.1-14.2	0.02-0.06	0.2-0.7	0.0-0.5
	16-32	70	20	10-15	1.50-1.60	2.8-9.9	0.08-0.12	0.7-1.3	0.0-0.5
	32-39	73	15	10-15	1.50-1.60	2.8-9.9	0.08-0.12	0.7-1.3	0.0-0.5
	39-59	85	9	6-12	1.60-1.70	7.1-14.2	0.05-0.07	0.4-1.0	0.0-0.5
3526: Cajon-----	0-1	80-88	5-19	1-7	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.5	0.0-0.5
	1-33	70-98	1-26	1-5	1.55-1.65	7.1-14.2	0.06-0.08	0.0-0.4	0.0-0.3
	33-61	80-98	1-16	1-4	1.60-1.70	7.1-14.2	0.06-0.08	0.0-0.3	0.0-0.3
Hypoint-----	0-1	76-85	12	1-5	1.55-1.65	7.1-14.2	0.07-0.10	0.0-0.4	0.0-0.5
	1-19	87-97	10	1-5	1.65-1.75	7.1-14.2	0.05-0.07	0.0-0.4	0.0-0.3
	19-59	87-97	7	1-5	1.60-1.70	7.1-14.2	0.03-0.05	0.0-0.3	0.0-0.3
Arizo, occasionally flooded-----	0-2	95	4	1-1	1.70-1.80	7.1-14.2	0.02-0.06	0.0-0.1	0.0-0.5
	2-10	95	4	1-1	1.70-1.80	7.1-14.2	0.01-0.05	0.0-0.0	0.0-0.3
	10-59	95	4	1-1	1.70-1.80	7.1-14.2	0.01-0.03	0.0-0.0	0.0-0.3
3611: Burntshack, sand surface-----	0-2	88-90	7	2-4	1.70-1.80	7.8-14.2	0.03-0.07	0.1-0.3	0.0-0.5
	2-7	87-88	8	4-4	1.60-1.70	7.1-14.2	0.05-0.08	0.3-0.3	0.0-0.3
	7-12	86-92	8	3-4	1.60-1.70	7.1-14.2	0.04-0.07	0.2-0.3	0.0-0.3
	12-30	87-87	7	5-6	1.60-1.75	7.1-14.2	0.03-0.08	0.3-0.5	0.0-0.3
	30-39	70-78	16	8-14	1.50-1.60	7.1-14.2	0.09-0.12	0.5-1.4	0.0-0.3
	39-59	85-90	11	2-4	1.60-1.70	7.1-14.2	0.08-0.11	0.1-0.3	0.0-0.3

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
3611: Burntshack-----	0-2	88	8	2-6	1.60-1.70	1.4-14.2	0.05-0.07	0.1-0.5	0.0-0.5
	2-7	87-88	8	4-4	1.60-1.70	1.4-14.2	0.05-0.08	0.3-0.3	0.0-0.3
	7-12	86-92	8	3-4	1.60-1.70	1.4-14.2	0.04-0.07	0.2-0.3	0.0-0.3
	12-30	87-87	7	5-6	1.60-1.75	1.4-14.2	0.03-0.08	0.3-0.5	0.0-0.3
	30-39	70-78	16	8-14	1.50-1.60	1.4-14.2	0.09-0.12	0.5-1.4	0.0-0.3
3612: Burntshack-----	39-59	85-90	11	2-4	1.60-1.70	1.4-14.2	0.08-0.11	0.1-0.3	0.0-0.3
	0-2	88	8	2-6	1.60-1.70	7.1-14.2	0.05-0.07	0.1-0.5	0.0-0.5
	2-17	86-92	8	3-4	1.60-1.70	7.1-14.2	0.04-0.07	0.2-0.3	0.0-0.3
	17-27	87-92	5	5-6	1.60-1.75	7.1-14.2	0.03-0.06	0.3-0.5	0.0-0.3
	27-59	70-78	16	8-14	1.50-1.60	2.8-9.9	0.09-0.12	0.5-1.4	0.0-0.3
Burntshack, occasionally flooded-----	0-2	88-92	8	2-6	1.60-1.70	7.1-14.2	0.04-0.06	0.1-0.5	0.0-0.5
	2-17	86-92	8	3-4	1.60-1.70	7.1-14.2	0.04-0.07	0.2-0.3	0.0-0.3
	17-27	87-92	5	5-6	1.60-1.75	7.1-14.2	0.03-0.06	0.3-0.5	0.0-0.3
	27-59	70-78	16	8-14	1.50-1.60	2.8-9.9	0.09-0.12	0.5-1.4	0.0-0.3
3676: Morongo, loamy sand, very rarely flooded-	0-0	85	12	2-8	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.6	0.0-0.3
	0-20	79	17	2-8	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.6	0.0-0.3
	20-60	79	16	2-8	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.6	0.0-0.3
3677: Morongo-----	0-1	95	3	2-6	1.60-1.70	1.4-14.2	0.04-0.08	0.1-0.5	0.0-0.5
	1-6	95	3	2-8	1.60-1.70	1.4-14.2	0.04-0.08	0.1-0.6	0.0-0.3
	6-28	95	3	1-8	1.60-1.70	1.4-14.2	0.04-0.08	0.0-0.6	0.0-0.3
	28-59	95	3	2-5	1.65-1.75	1.4-14.2	0.04-0.08	0.1-0.4	0.0-0.5
3679: Morongo, cool---	0-2	95	2	1-8	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.7	0.0-0.5
	2-6	95	3	2-8	1.60-1.85	7.1-14.2	0.04-0.08	0.0-0.6	0.0-0.3
	6-19	86	11	2-8	1.60-1.75	7.1-14.2	0.04-0.08	0.0-0.6	0.0-0.3
	19-59	85	11	1-8	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.6	0.0-0.3
Jumborox-----	0-1	90	6	2-5	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.4	0.0-0.5
	1-4	85	10	2-10	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.9	0.0-0.5
	4-14	78	14	6-18	1.50-1.60	2.8-9.9	0.08-0.13	0.4-1.8	0.0-0.3
	14-22	75	15	6-18	1.50-1.60	2.8-9.9	0.08-0.13	0.4-1.8	0.0-0.3
	22-37	82	11	6-18	1.60-1.70	7.1-14.2	0.05-0.08	0.4-1.8	0.0-0.3
	37-71	87	8	2-8	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.7	0.0-0.3

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
3680: Morongo-----	0-1	85	8	2-7	1.55-1.65	7.1-14.2	0.06-0.08	0.1-0.6	0.0-0.5
	1-2	88	7	1-5	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.4	0.0-0.3
	2-35	94	3	1-3	1.65-1.75	7.1-14.2	0.04-0.08	0.0-0.2	0.0-0.3
	35-59	95	2	1-3	1.70-1.80	7.1-14.2	0.02-0.07	0.0-0.2	0.0-0.3
3681: Morongo, very rarely flooded-	0-1	95	3	2-6	1.60-1.70	1.4-14.2	0.04-0.08	0.1-0.5	0.0-0.5
	1-6	95	3	2-8	1.60-1.70	1.4-14.2	0.04-0.08	0.1-0.6	0.0-0.3
	6-28	95	3	1-8	1.60-1.70	1.4-14.2	0.04-0.08	0.0-0.6	0.0-0.3
	28-59	95	3	2-5	1.70-1.80	1.4-14.2	0.03-0.07	0.1-0.4	0.0-0.3
Jumborox dry----	0-1	90	6	2-5	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.4	0.0-0.5
	1-4	85	10	2-10	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.9	0.0-0.5
	4-14	78	14	6-18	1.50-1.60	2.8-14.2	0.08-0.13	0.4-1.8	0.0-0.3
	14-22	75	15	6-18	1.50-1.60	2.8-14.2	0.08-0.13	0.4-1.8	0.0-0.3
	22-37	82	11	6-18	1.60-1.70	2.8-14.2	0.05-0.08	0.4-1.8	0.0-0.3
3682: Morongo, cool----	37-71	87	8	2-8	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.7	0.0-0.3
	0-2	95	2	1-8	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.7	0.0-0.5
	2-6	95	3	2-8	1.60-1.85	7.1-14.2	0.04-0.08	0.1-0.6	0.0-0.3
	6-19	86	11	2-8	1.60-1.75	7.1-14.2	0.04-0.08	0.1-0.6	0.0-0.3
Jumborox-----	19-59	85	11	1-8	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.6	0.0-0.3
	0-2	83	13	2-10	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.9	0.0-0.5
	2-8	81	13	2-10	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.9	0.0-0.5
	8-21	78	10	6-18	1.50-1.60	2.8-9.9	0.08-0.13	0.4-1.8	0.0-0.3
3683: Morongo-----	21-33	82	9	6-18	1.60-1.70	2.8-12.7	0.05-0.10	0.4-1.8	0.0-0.3
	33-59	90	7	2-8	1.65-1.75	7.1-14.2	0.05-0.08	0.1-0.7	0.0-0.3
	0-1	85	10	2-5	1.55-1.65	7.1-14.2	0.06-0.08	0.1-0.4	0.0-0.5
	1-59	89	8	1-4	1.70-1.80	7.1-14.2	0.03-0.07	0.0-0.3	0.0-0.3
Bluecut, very rarely flooded-									
	0-1	74	21	4-10	1.45-1.55	2.8-9.9	0.09-0.13	0.3-0.9	0.0-0.5
	1-12	65	13	20-25	1.45-1.55	0.1-2.8	0.12-0.18	1.8-2.6	0.0-0.3
	12-26	72	14	4-14	1.55-1.60	2.8-9.9	0.07-0.12	0.2-1.1	0.0-0.3
	26-33	85	10	2-5	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.3
3684: Morongo, warm----	33-59	87	10	2-3	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.2	0.0-0.3
	0-1	85	9	2-8	1.60-1.70	1.4-14.2	0.04-0.08	0.1-0.6	0.0-0.3
	1-5	85	10	2-8	1.55-1.65	1.4-14.2	0.05-0.07	0.1-0.6	0.0-0.3
	5-16	95	2	2-8	1.60-1.70	1.4-14.2	0.04-0.08	0.1-0.6	0.0-0.3
	16-79	96	2	2-8	1.60-1.70	1.4-14.2	0.04-0.08	0.1-0.6	0.0-0.3

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
3685: Morongo, cool----	0-2	95	2	1-8	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.7	0.0-0.5
	2-6	95	3	1-8	1.60-1.85	7.1-14.2	0.04-0.08	0.0-0.6	0.0-0.3
	6-19	86	11	2-8	1.60-1.75	7.1-14.2	0.04-0.08	0.0-0.6	0.0-0.3
	19-59	85	11	1-8	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.6	0.0-0.3
Desertqueen, undulating-----	0-3	80-85	15-27	4-8	1.60-1.70	7.1-14.2	0.05-0.08	0.3-0.7	0.0-0.5
	3-12	55-75	15-27	10-18	1.50-1.60	2.8-9.9	0.08-0.12	0.5-1.7	0.0-0.3
	12-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
3690: Nasagold-----	0-1	82-89	10	4-10	1.55-1.65	7.1-14.2	0.05-0.08	0.2-0.8	0.0-0.5
	1-6	78-92	10	4-10	1.45-1.55	2.8-9.9	0.09-0.12	0.2-0.9	0.0-0.3
	6-20	55-95	10	5-15	1.45-1.55	2.8-9.9	0.09-0.12	0.3-1.5	0.0-0.3
	20-37	72-80	14	5-15	1.45-1.55	2.8-9.9	0.09-0.12	0.3-1.4	0.0-0.3
	37-59	78-88	12	5-15	1.50-1.60	2.8-12.7	0.09-0.12	0.3-1.4	0.0-0.3
3695: Gocougs-----	0-2	80-88	10-18	3-6	1.60-1.70	7.1-14.2	0.05-0.07	0.2-0.5	0.0-0.5
	2-6	65-88	8-21	4-14	1.60-1.70	7.1-14.2	0.04-0.08	0.3-1.3	0.0-0.3
	6-33	40-75	10-43	14-30	1.45-1.55	0.1-1.4	0.10-0.18	0.9-3.4	0.0-0.3
	33-46	60-75	15-32	8-15	1.45-1.55	0.0-0.1	0.00-0.01	0.5-1.1	0.0-0.3
	46-65	90-92	5-8	2-3	1.60-1.70	7.1-14.2	0.00-0.00	0.0-0.0	0.0-0.3
4031: Crosgrain-----	0-1	75	16	8-15	1.45-1.55	2.8-9.9	0.07-0.09	0.4-1.1	0.0-0.3
	1-6	75	15	10-18	1.45-1.55	2.8-9.9	0.12-0.15	0.4-1.2	0.0-0.3
	6-13	70	22	8-12	1.50-1.60	2.8-9.9	0.06-0.08	0.3-0.7	0.0-0.3
	13-22	---	---	---	---	0.0-0.0	0.00-0.10	---	---
Crackerjack-----	0-1	66	23	8-15	1.45-1.55	2.8-9.9	0.08-0.10	0.4-1.2	0.0-0.5
	1-7	45	45	8-15	1.45-1.55	2.8-9.9	0.08-0.10	0.4-1.3	0.0-0.5
	7-13	55	35	10-15	1.45-1.55	2.8-9.9	0.10-0.14	0.6-1.1	0.0-0.5
	13-59	68	24	8-12	1.45-1.55	0.0-0.0	0.00-0.00	0.3-0.7	0.0-0.3
Pinkcan, dry-----	0-0	55-78	20	10-18	1.45-1.55	2.8-9.9	0.10-0.12	0.8-1.7	0.0-0.5
	0-11	25-78	11	15-30	1.40-1.60	0.0-2.8	0.09-0.17	1.0-3.7	0.0-0.3
	11-19	40-75	13	20-30	1.40-1.55	0.0-4.2	0.13-0.17	1.0-3.7	0.0-0.3
	19-25	40-75	29	15-25	1.40-1.55	0.0-1.4	0.13-0.19	0.8-2.9	0.0-0.3
	25-28	55-78	16	8-15	1.50-1.60	2.8-9.9	0.09-0.12	0.5-1.2	0.0-0.3
	28-33	55-78	16	8-15	1.50-1.60	2.8-9.9	0.07-0.09	0.5-1.2	0.0-0.3
	33-47	55-85	18	8-15	1.50-1.60	2.8-9.9	0.09-0.11	0.5-1.2	0.0-0.0
	47-60	72-89	14	4-12	1.50-1.70	0.0-0.1	0.00-0.01	0.2-0.9	0.0-0.0

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
4041: Silvermine-----	0-1	80	11	6-10	1.55-1.65	7.1-14.2	0.05-0.07	0.4-0.8	0.0-0.3
	1-7	80	12	3-8	1.65-1.75	7.1-14.2	0.05-0.07	0.2-0.6	0.0-0.3
	7-55	82	12	3-6	1.60-1.70	0.0-0.1	0.00-0.01	0.2-0.5	0.0-0.3
	55-59	82	11	3-8	1.60-1.70	7.1-14.2	0.05-0.07	0.2-0.7	0.0-0.3
Helendale-----	0-2	65-85	23	8-15	1.45-1.55	2.8-9.9	0.10-0.13	0.6-1.5	0.0-0.5
	2-16	60-79	25	8-18	1.50-1.60	2.8-9.9	0.09-0.12	0.6-1.8	0.0-0.5
	16-59	95-96	3	1-4	1.65-1.75	7.1-14.2	0.04-0.07	0.0-0.3	0.0-0.3
Burntshack, very rarely flooded-	0-2	88	9	2-6	1.60-1.70	7.1-14.2	0.05-0.07	0.1-0.5	0.0-0.5
	2-31	85-92	11	3-4	1.60-1.70	7.1-14.2	0.05-0.07	0.2-0.3	0.0-0.3
	31-43	70-78	17	8-14	1.45-1.55	2.8-9.9	0.09-0.12	0.6-1.3	0.0-0.3
	43-51	75-90	14	2-12	1.45-1.55	2.8-9.9	0.09-0.11	0.1-1.1	0.0-0.3
	51-59	75-87	16	8-12	1.45-1.55	2.8-9.9	0.09-0.11	0.6-1.1	0.0-0.3
4064: Gravesmit-----	0-1	76-87	13	4-6	1.55-1.65	7.1-14.2	0.08-0.11	0.3-0.5	0.0-0.5
	1-7	55-87	17	2-10	1.60-1.70	2.8-14.2	0.08-0.14	0.1-0.9	0.0-0.3
	7-13	55-78	15	8-18	1.50-1.60	2.8-9.9	0.10-0.15	0.5-1.8	0.0-0.3
	13-29	55-78	13	8-18	1.50-1.60	2.8-9.9	0.10-0.15	0.5-1.8	0.0-0.3
	29-41	87-97	3	2-5	1.65-1.80	7.1-14.2	0.02-0.04	0.1-0.3	0.0-0.3
	41-45	55-78	12	8-18	1.50-1.60	2.8-9.9	0.10-0.15	0.5-1.8	0.0-0.3
Helendale, sandy surface-----	45-60	90-98	2	2-8	1.70-1.80	7.1-14.2	0.02-0.04	0.1-0.6	0.0-0.3
	0-10	78-87	15	4-8	1.55-1.65	7.1-14.2	0.05-0.08	0.3-0.7	0.0-0.5
	10-37	50-75	17	8-18	1.50-1.60	1.4-9.9	0.09-0.12	0.6-1.8	0.0-0.3
4071: Helendale-----	37-59	55-75	17	8-18	1.50-1.60	2.8-9.9	0.09-0.12	0.6-1.8	0.0-0.3
	0-4	55-70	33	8-12	1.45-1.55	2.8-9.9	0.09-0.12	0.6-1.1	0.0-0.5
	4-37	50-75	17	8-18	1.50-1.60	1.4-9.9	0.09-0.12	0.6-1.8	0.0-0.3
Desertqueen, very rarely flooded-----	37-59	55-75	17	8-18	1.50-1.60	2.8-9.9	0.09-0.12	0.6-1.8	0.0-0.3
	0-2	60-75	15-36	6-10	1.50-1.60	2.8-9.9	0.09-0.12	0.4-0.9	0.0-0.5
	2-5	55-75	15-27	10-18	1.50-1.60	2.8-9.9	0.08-0.12	0.5-1.7	0.0-0.3
	5-12	55-75	15-27	10-18	1.55-1.65	2.8-9.9	0.08-0.11	0.5-1.7	0.0-0.3
	12-14	85-88	6-9	6-8	1.65-1.75	7.1-14.2	0.01-0.03	0.1-0.3	0.0-0.3
	14-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---



Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
4091: Littlefargo-----	0-1	82-88	6-15	3-6	1.60-1.70	7.1-14.2	0.06-0.08	0.2-0.5	0.0-0.5
	1-4	70-80	10-26	4-10	1.50-1.60	2.8-9.9	0.10-0.12	0.3-0.9	0.0-0.3
	4-31	70-76	6-22	8-18	1.50-1.60	2.8-9.9	0.10-0.12	0.6-1.8	0.0-0.3
	31-34	70-82	12-24	6-12	1.50-1.60	2.8-9.9	0.09-0.12	0.4-1.1	0.0-0.3
	34-59	---	---	---	---	0.0-0.1	0.00-0.01	---	---
4245: Bluecut-----	0-4	85	12	3-8	1.60-1.75	7.1-14.2	0.05-0.08	0.2-0.7	0.0-0.5
	4-11	85	10	3-12	1.65-1.75	2.8-14.2	0.05-0.08	0.2-1.1	0.0-0.3
	11-21	70	10	20-28	1.45-1.55	0.1-1.4	0.11-0.17	1.9-3.5	0.0-0.3
	21-26	75	17	3-14	1.50-1.65	2.8-9.9	0.07-0.10	0.1-1.3	0.0-0.3
	26-49	85	10	3-14	1.50-1.65	7.1-14.2	0.07-0.11	0.1-1.3	0.0-0.3
Morongo, very rarely flooded-	49-79	85	11	2-12	1.55-1.75	7.1-14.2	0.05-0.08	0.1-1.1	0.0-0.3
	0-1	95	3	2-6	1.60-1.70	1.4-14.2	0.04-0.08	0.1-0.5	0.0-0.5
	1-6	95	3	2-8	1.60-1.70	1.4-14.2	0.04-0.08	0.1-0.6	0.0-0.3
	6-28	95	3	1-8	1.60-1.70	1.4-14.2	0.04-0.08	0.0-0.6	0.0-0.3
	28-59	95	3	2-5	1.70-1.80	1.4-14.2	0.03-0.07	0.1-0.4	0.0-0.3
Yander, very rarely flooded-	0-2	80	16	3-4	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	2-23	79	16	4-5	1.60-1.70	7.1-14.2	0.05-0.07	0.1-0.4	0.0-0.3
	23-40	90	7	2-7	1.70-1.80	7.1-14.2	0.02-0.05	0.1-0.4	0.0-0.3
	40-79	---	---	---	---	0.1-1.4	0.00-0.01	---	---
4260: Minhoyt-----	0-1	55-65	22-33	10-15	1.45-1.55	2.8-9.9	0.10-0.13	0.6-1.3	0.0-0.5
	1-2	50-80	16-36	4-15	1.45-1.70	7.1-14.2	0.05-0.07	0.1-0.9	0.0-0.3
	2-12	80-95	3-15	2-5	1.65-1.85	0.0-0.1	0.00-0.00	0.0-0.1	0.0-0.3
	12-59	---	---	---	---	0.0-0.0	0.00-0.00	---	---
Corbilt, rarely flooded-----	0-6	90-98	1-6	1-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	6-14	80-98	0-14	1-7	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.6	0.0-0.3
	14-51	70-80	12-28	7-13	1.50-1.60	2.8-9.9	0.10-0.13	0.4-0.9	0.0-0.3
	51-59	80-85	11	1-5	1.60-1.70	0.0-0.1	0.00-0.00	0.0-0.2	0.0-0.3
4265: Werewolf, warm--	0-2	50-75	29	7-14	1.40-1.50	2.8-9.9	0.05-0.09	0.4-1.1	0.0-0.5
	2-19	60-75	23	10-18	1.55-1.65	1.0-9.9	0.05-0.07	0.5-1.2	0.0-0.3
	19-24	60-75	18	14-16	1.55-1.65	1.0-9.9	0.05-0.09	0.4-1.0	0.0-0.3
	24-30	68-80	17	8-10	1.55-1.65	2.8-9.9	0.03-0.06	0.3-0.7	0.0-0.3
	30-59	80-88	11	7-8	1.55-1.65	7.1-14.2	0.01-0.03	0.3-0.5	0.0-0.3

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Table 19.-Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
4270: Yuccabutte, extremely cobble sandy loam-----	0-2	35-52	37	12-20	1.40-1.50	0.1-1.4	0.08-0.11	0.4-1.5	0.0-0.5
	2-16	20-52	46	18-30	1.40-1.55	0.0-1.4	0.02-0.14	0.3-3.0	0.0-0.3
	16-30	40-70	25	18-30	1.45-1.55	0.1-4.2	0.01-0.12	0.2-3.0	0.0-0.3
	30-39	55-80	5	15-20	1.50-1.60	2.8-9.9	0.05-0.09	0.6-1.5	0.0-0.3
	39-53	60-75	20	10-15	1.50-1.60	2.8-9.9	0.09-0.12	0.8-1.4	0.0-0.3
	53-60	80-87	10	5-8	1.60-1.70	7.1-14.2	0.04-0.07	0.3-0.6	0.0-0.1
4271: Yuccabutte, warm	0-0	35-50	42	18-25	1.40-1.50	0.1-1.4	0.13-0.17	1.6-3.0	0.0-0.5
	0-6	25-45	43	20-35	1.40-1.50	0.0-0.1	0.11-0.18	0.6-3.7	0.0-0.3
	6-20	40-70	11	20-30	1.45-1.55	0.1-4.2	0.01-0.12	0.2-3.0	0.0-0.3
	20-39	55-80	5	15-20	1.50-1.60	2.8-9.9	0.05-0.09	0.6-1.5	0.0-0.3
	39-53	60-75	20	10-15	1.50-1.60	2.8-9.9	0.09-0.12	0.8-1.4	0.0-0.3
	53-60	80-87	10	5-8	1.60-1.70	7.1-14.2	0.04-0.07	0.3-0.6	0.0-0.1
Arizo, rarely flooded-----	0-2	85	10	3-5	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.3	0.0-0.5
	2-15	85	12	3-5	1.55-1.65	7.1-14.2	0.04-0.07	0.1-0.3	0.0-0.3
	15-59	95	4	1-1	1.60-1.70	7.1-14.2	0.02-0.05	0.0-0.0	0.0-0.3
4275: Pinkcan-----	0-1	25-50	47	10-20	1.40-1.50	0.1-1.4	0.13-0.16	0.8-2.2	0.0-0.5
	1-11	25-78	11	15-30	1.40-1.60	0.0-2.8	0.09-0.17	1.0-3.7	0.0-0.3
	11-19	40-75	13	20-30	1.40-1.55	0.0-4.2	0.13-0.17	1.0-3.7	0.0-0.3
	19-25	40-75	29	15-25	1.40-1.55	0.0-1.4	0.13-0.19	0.8-2.9	0.0-0.3
	25-28	55-78	16	8-15	1.50-1.60	2.8-9.9	0.09-0.12	0.5-1.2	0.0-0.3
	28-33	55-78	16	8-15	1.50-1.60	2.8-9.9	0.07-0.09	0.5-1.2	0.0-0.3
	33-47	55-85	18	8-15	1.50-1.60	2.8-9.9	0.09-0.11	0.5-1.2	0.0-0.0
	47-60	72-89	14	4-12	1.50-1.70	0.0-0.1	0.00-0.01	0.2-0.9	0.0-0.0
	0-1	76-87	12	3-6	1.55-1.65	7.1-14.2	0.06-0.08	0.2-0.5	0.0-0.5
	1-15	55-78	21	8-15	1.50-1.60	2.8-9.9	0.10-0.12	0.6-1.4	0.0-0.3
Werewolf-----	15-31	55-78	22	10-18	1.50-1.60	2.8-9.9	0.05-0.07	0.4-1.2	0.0-0.3
	31-41	55-78	22	10-18	1.50-1.60	2.8-9.9	0.05-0.07	0.4-1.2	0.0-0.3
	41-54	80-87	11	6-9	1.65-1.75	7.1-14.2	0.04-0.05	0.3-0.6	0.0-0.3
	54-65	80-87	11	6-9	1.65-1.75	7.1-14.2	0.04-0.05	0.4-0.8	0.0-0.3
	0-1	55	29	12-16	1.45-1.55	2.8-9.9	0.12-0.15	0.0-3.0	0.0-0.5
	1-8	40-50	32	8-28	1.40-1.50	0.0-1.4	0.15-0.20	3.0-6.0	0.0-0.3
Gocougs, warm---	8-34	40-65	10-35	18-25	1.45-1.55	0.1-4.2	0.10-0.15	0.0-3.0	0.0-0.3
	34-39	80	15	5-8	1.65-1.75	0.0-0.1	0.00-0.01	0.0-3.0	0.0-0.3

Table 19.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
4280: Mekkadale-----	0-1	35-52	34	8-16	1.40-1.50	0.1-1.4	0.13-0.16	0.6-1.4	0.0-0.5
	1-12	35-75	34	20-28	1.45-1.55	0.1-1.4	0.13-0.17	1.8-3.5	0.0-0.3
	12-19	55-78	22	15-20	1.50-1.60	1.0-2.8	0.09-0.12	1.2-1.9	0.0-0.3
	19-26	55-85	11	3-10	1.50-1.70	0.0-0.1	0.01-0.02	0.2-0.7	0.0-0.3
	26-59	75-90	14	3-10	1.60-1.85	7.1-14.2	0.02-0.06	0.2-0.7	0.0-0.1
Edalaph, warm----	0-2	55-78	19	5-12	1.45-1.55	7.1-14.2	0.09-0.11	0.3-1.0	0.0-0.5
	2-15	55-78	18	5-12	1.50-1.60	7.1-14.2	0.08-0.10	0.3-1.1	0.0-0.3
	15-20	55-78	15	5-12	1.50-1.60	7.1-14.2	0.09-0.12	0.3-0.9	0.0-0.3
	20-31	76-87	15	2-6	1.65-1.75	7.1-14.2	0.05-0.06	0.1-0.2	0.0-0.3
	31-59	76-87	12	2-6	1.65-1.75	7.1-14.2	0.04-0.05	0.1-0.4	0.0-0.3
4285: Typic Argidurids-----	0-1	55-78	34	10-15	1.45-1.55	14.2-19.8	0.00-0.01	0.1-0.2	0.0-0.5
	1-2	55-78	34	10-12	1.45-1.55	2.8-9.9	0.12-0.14	0.8-1.2	0.0-0.5
	2-7	25-52	35	18-22	1.40-1.50	0.1-1.4	0.10-0.13	1.1-1.9	0.0-0.5
	7-18	20-45	42	27-30	1.35-1.45	0.0-0.1	0.09-0.12	1.4-2.6	0.0-0.3
	18-23	25-52	33	15-22	1.40-1.50	0.1-1.4	0.07-0.09	0.6-1.5	0.0-0.3
	23-33	---	---	---	---	0.0-0.0	0.00-0.01	---	---
Coppermine-----	0-1	55-78	20	6-12	1.45-1.55	2.8-9.9	0.12-0.14	0.4-1.1	0.0-0.5
	1-8	55-78	23	12-20	1.50-1.60	1.0-2.8	0.06-0.08	0.4-1.5	0.0-0.3
	8-11	40-75	18	20-22	1.45-1.55	0.1-4.2	0.04-0.05	0.5-1.0	0.0-0.3
	11-20	---	---	---	---	0.1-1.4	0.00-0.00	---	---
Minhoyt, warm---	0-1	55-65	22-33	10-15	1.45-1.55	2.8-9.9	0.09-0.13	0.7-1.3	0.0-0.5
	1-7	50-80	16-36	4-15	1.45-1.55	7.1-14.2	0.05-0.07	0.1-1.0	0.0-0.3
	7-59	---	---	---	---	0.0-0.0	0.00-0.00	---	---
4403: Arizo, rarely flooded, channeled-----	0-6	92	7	1-1	1.60-1.70	7.1-14.2	0.04-0.06	0.0-0.1	0.0-0.5
	6-59	96	3	1-1	1.70-1.80	7.1-14.2	0.01-0.03	0.0-0.0	0.0-0.3
Arizo, rarely flooded-----	0-6	92	7	1-1	1.60-1.70	7.1-14.2	0.04-0.06	0.0-0.1	0.0-0.5
	6-59	96	3	1-1	1.70-1.80	7.1-14.2	0.01-0.03	0.0-0.0	0.0-0.3
Arizo-----	0-4	65	30	5-6	1.50-1.60	2.8-9.9	0.09-0.12	0.3-0.5	0.0-0.5
	4-59	96	3	1-1	1.70-1.80	7.1-14.2	0.01-0.03	0.0-0.0	0.0-0.3

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
4440: Dragonwash, occasionally flooded-----	0-1 1-5 5-59	82-85 90-98 90-98	14 4 4	1-8 1-3 1-3	1.55-1.65 1.60-1.70 1.60-1.80	7.1-14.2 7.1-14.2 7.1-14.2	0.05-0.08 0.05-0.08 0.05-0.08	0.0-0.5 0.0-0.1 0.0-0.1	0.0-0.5 0.0-0.3 0.0-0.3
Dragonwash, frequently flooded-----	0-1 1-10 10-59	90-95 90-98 90-98	9 4 4	1-1 1-3 1-3	1.60-1.75 1.60-1.70 1.60-1.80	7.1-14.2 7.1-14.2 7.1-14.2	0.05-0.08 0.05-0.08 0.05-0.08	0.0-0.0 0.0-0.1 0.0-0.1	0.0-0.5 0.0-0.3 0.0-0.3
4450: Morongo, occasionally flooded-----	0-6 6-18 18-60	95 95 90	3 3 7	2-8 2-8 2-8	1.65-1.75 1.70-1.80 1.70-1.80	7.1-14.2 7.1-14.2 7.1-14.2	0.05-0.07 0.03-0.06 0.04-0.07	0.1-0.6 0.1-0.6 0.1-0.6	0.0-0.3 0.0-0.3 0.0-0.3
Morongo, frequently flooded-----	0-2 2-7 7-60	92 92 96	5 5 1	2-8 2-8 2-8	1.60-1.70 1.60-1.70 1.60-1.70	1.4-14.2 1.4-14.2 1.4-14.2	0.04-0.07 0.04-0.07 0.04-0.07	0.0-3.0 0.0-3.0 0.0-3.0	0.0-0.3 0.0-0.3 0.0-0.3
4605: Pinecity, moist-	0-1 1-8 8-59	85 85 ---	8 7 ---	3-9 3-8 ---	1.55-1.65 1.55-1.65 ---	7.1-14.2 7.1-14.2 0.0-0.1	0.06-0.08 0.06-0.08 0.00-0.01	0.2-0.8 0.1-0.6 ---	0.0-0.5 0.0-0.3 ---
4606: Pinecity-----	0-1 1-6 6-59	86 81 ---	9 11 ---	2-9 1-8 ---	1.55-1.65 1.60-1.70 ---	7.1-14.2 7.1-14.2 0.0-0.1	0.04-0.08 0.04-0.08 0.00-0.01	0.1-0.7 0.0-0.7 ---	0.0-0.5 0.0-0.5 ---
4607: Pinecity-----	0-2 2-6 6-59	93 91 ---	5 6 ---	2-9 1-8 ---	1.65-1.75 1.55-1.65 ---	7.1-14.2 7.1-14.2 0.0-0.1	0.05-0.08 0.06-0.08 0.00-0.01	0.0-3.0 0.0-3.0 ---	0.0-0.5 0.0-0.3 ---
4608: Pinecity-----	0-2 2-5 5-59	85 85 ---	10 10 ---	3-9 1-8 ---	1.55-1.65 1.60-1.70 ---	7.1-14.2 7.1-14.2 0.0-0.1	0.05-0.08 0.06-0.08 0.00-0.01	0.2-0.7 0.1-0.6 ---	0.0-0.5 0.0-0.3 ---

Soil Survey of Joshua Tree National Park, California

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
4610:									
Desertqueen----	0-2	60-75	15-36	6-10	1.50-1.60	2.8-9.9	0.09-0.12	0.4-0.9	0.0-0.5
	2-5	55-75	15-27	10-18	1.50-1.60	2.8-9.9	0.08-0.12	0.5-1.7	0.0-0.3
	5-12	55-75	15-27	10-18	1.55-1.65	2.8-9.9	0.08-0.11	0.5-1.7	0.0-0.3
	12-14	85-88	6-9	6-8	1.65-1.75	7.1-14.2	0.01-0.03	0.1-0.3	0.0-0.3
	14-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Jumborox, warm--	0-1	85	11	2-10	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.9	0.0-0.5
	1-3	85	9	2-10	1.55-1.65	2.8-14.2	0.05-0.08	0.1-0.9	0.0-0.5
	3-17	80	8	6-18	1.50-1.60	2.8-9.9	0.08-0.12	0.4-1.8	0.0-0.3
	17-28	85	7	6-18	1.50-1.60	2.8-14.2	0.05-0.12	0.4-1.7	0.0-0.3
	28-53	85	10	2-8	1.50-1.60	7.1-14.2	0.04-0.08	0.1-0.7	0.0-0.3
	53-71	95	2	2-8	1.50-1.60	7.1-14.2	0.04-0.08	0.1-0.7	0.0-0.3
4615:									
Desertqueen,									
cool-----	0-3	60-75	15-36	6-10	1.50-1.60	2.8-9.9	0.09-0.12	0.4-0.9	0.0-0.5
	3-13	55-75	15-27	10-18	1.50-1.60	2.8-9.9	0.08-0.12	0.5-1.7	0.0-0.3
	13-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
Jumborox-----	0-1	90	6	2-5	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.4	0.0-0.5
	1-4	85	10	2-10	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.9	0.0-0.5
	4-14	78	14	6-18	1.50-1.60	2.8-14.2	0.08-0.13	0.4-1.8	0.0-0.3
	14-22	75	15	6-18	1.50-1.60	2.8-14.2	0.08-0.13	0.4-1.8	0.0-0.3
	22-37	82	11	6-18	1.60-1.70	2.8-14.2	0.05-0.08	0.4-1.8	0.0-0.3
	37-71	87	8	2-8	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.7	0.0-0.3
4620:									
Stranger-----	0-1	78-87	17	1-8	1.55-1.65	7.1-14.2	0.05-0.07	0.0-0.6	0.0-0.5
	1-3	75-97	4	1-5	1.55-1.70	7.1-14.2	0.05-0.08	0.0-0.3	0.0-0.0
	3-13	---	---	---	---	0.0-0.1	0.00-0.00	---	---
Grubstake, moist	0-1	78-87	10	4-8	1.55-1.65	7.1-14.2	0.07-0.11	0.3-0.7	0.0-0.5
	1-15	55-75	14	8-15	1.50-1.60	2.8-9.9	0.09-0.14	0.4-1.3	0.0-0.3
	15-18	---	---	---	---	0.1-1.4	0.00-0.01	---	---
	18-28	---	---	---	---	0.0-0.0	0.00-0.00	---	---
4625:									
Grinder-----	0-0	55-78	21	8-15	1.45-1.55	2.8-9.9	0.10-0.12	0.5-1.3	0.0-0.5
	0-3	55-78	18	12-23	1.45-1.60	0.1-9.9	0.10-0.12	0.7-2.5	0.0-0.3
	3-8	40-78	9	15-18	1.45-1.60	0.1-4.2	0.08-0.14	0.9-1.6	0.0-0.3
	8-18	---	---	---	---	0.0-0.1	0.00-0.01	---	---
Grinder, cool---	0-1	42-55	43	8-12	1.40-1.50	0.1-1.4	0.11-0.14	0.5-1.0	0.0-0.5
	1-3	55-78	18	12-23	1.45-1.60	0.1-9.9	0.10-0.12	0.7-2.5	0.0-0.3
	3-8	40-78	9	15-18	1.45-1.60	0.1-4.2	0.08-0.14	0.9-1.6	0.0-0.3
	8-18	---	---	---	---	0.0-0.1	0.00-0.01	---	---

Soil Survey of Joshua Tree National Park, California

Table 19.-Physical Soil Properties-Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
4625: Pinkcan, cool----	0-0	55-78	20	10-18	1.45-1.55	2.8-9.9	0.10-0.12	0.8-1.7	0.0-0.5
	0-11	25-78	11	15-30	1.40-1.60	0.0-2.8	0.09-0.17	1.0-3.7	0.0-0.3
	11-19	40-75	13	20-30	1.40-1.55	0.0-4.2	0.13-0.17	1.0-3.7	0.0-0.3
	19-25	40-75	29	15-25	1.40-1.55	0.0-1.4	0.13-0.19	0.8-2.9	0.0-0.3
	25-28	55-78	16	8-15	1.50-1.60	2.8-9.9	0.09-0.12	0.5-1.2	0.0-0.3
	28-33	55-78	16	8-15	1.50-1.60	2.8-9.9	0.07-0.09	0.5-1.2	0.0-0.3
	33-47	55-85	18	8-15	1.50-1.60	2.8-9.9	0.09-0.11	0.5-1.2	0.0-0.0
4630: Thunderclap----	47-60	72-89	14	4-12	1.50-1.70	0.0-0.1	0.00-0.01	0.2-0.9	0.0-0.0
	0-2	89-98	1-11	2-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	2-11	85-98	1-11	2-4	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.3	0.0-0.5
	11-39	85-98	1-11	1-4	1.65-1.75	7.1-14.2	0.05-0.08	0.0-0.3	0.0-0.3
	39-63	85-98	1-11	1-4	1.65-1.75	7.1-14.2	0.05-0.08	0.0-0.3	0.0-0.3
	63-79	---	---	---	---	0.1-1.4	0.00-0.01	---	---
	0-1	85	11	2-6	1.55-1.70	7.1-14.2	0.05-0.08	0.1-0.5	0.0-1.0
Smithcanyon----	1-8	85	11	2-6	1.60-1.70	7.1-14.2	0.04-0.07	0.1-0.5	0.0-1.0
	8-13	90	6	2-6	1.60-1.70	7.1-14.2	0.02-0.07	0.1-0.5	0.0-0.8
	13-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
	0-2	79	15	3-8	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.6	0.0-0.3
4804: Ironped-----	2-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
	0-1	86	9	2-9	1.55-1.65	7.1-14.2	0.04-0.08	0.1-0.7	0.0-0.5
	1-6	81	11	1-8	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.7	0.0-0.5
	6-59	---	---	---	---	0.0-0.1	0.00-0.01	---	---
4805: Ironped, cool----	0-2	79	15	3-8	1.55-1.65	7.1-14.2	0.05-0.08	0.1-0.6	0.0-0.3
	2-59	---	---	---	---	0.1-1.4	0.00-0.01	---	---
	0-4	93	1	2-6	1.60-1.70	11.3-14.2	0.02-0.06	0.1-0.4	0.3-1.0
	4-10	88	4	2-8	1.60-1.75	7.1-12.7	0.03-0.07	0.1-0.6	0.3-0.5
4811: Pioneertown----	10-20	---	---	---	---	0.0-0.0	0.00-0.00	---	---
	0-1	78-87	10	4-8	1.55-1.65	7.1-14.2	0.07-0.11	0.3-0.7	0.0-0.5
	1-15	55-75	14	8-15	1.50-1.60	2.8-9.9	0.09-0.14	0.4-1.3	0.0-0.3
	15-18	---	---	---	---	0.1-1.4	0.00-0.01	---	---
4825: Grubstake-----	18-28	---	---	---	---	0.0-0.0	0.00-0.00	---	---
	0-1	78-87	10	4-8	1.55-1.65	7.1-14.2	0.07-0.11	0.3-0.7	0.0-0.5
	1-15	55-75	14	8-15	1.50-1.60	2.8-9.9	0.09-0.14	0.4-1.3	0.0-0.3
	15-18	---	---	---	---	0.1-1.4	0.00-0.01	---	---
	18-28	---	---	---	---	0.0-0.0	0.00-0.00	---	---

Table 19.--Physical Soil Properties--Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink- swell potential	Organic matter
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct
4825: Cajon, rarely flooded-----	0-1	89-95	3-5	2-6	1.60-1.70	7.1-14.2	0.05-0.08	0.1-0.5	0.0-0.5
	1-19	70-85	10-26	1-5	1.55-1.65	7.1-14.2	0.05-0.08	0.0-0.4	0.0-0.3
	19-38	80-85	11-16	1-4	1.60-1.70	7.1-14.2	0.04-0.07	0.0-0.3	0.0-0.3
	38-59	85-95	4-14	1-5	1.60-1.70	7.1-14.2	0.02-0.07	0.0-0.3	0.0-0.3
Stranger, warm--	0-1	89-97	4	1-5	1.60-1.70	7.1-14.2	0.05-0.07	0.0-0.4	0.0-0.5
	1-9	75-97	4	1-5	1.55-1.70	7.1-14.2	0.05-0.08	0.0-0.3	0.0-0.0
	9-19	---	---	---	---	0.0-0.1	0.00-0.00	---	---
4830: Pinecity, cool--	0-1	86	9	2-9	1.55-1.65	7.1-14.2	0.04-0.08	0.1-0.7	0.0-0.5
	1-6	81	11	1-8	1.60-1.70	7.1-14.2	0.04-0.08	0.0-0.7	0.0-0.5
	6-59	---	---	---	---	0.0-0.1	0.00-0.01	---	---
4900: Aguilareal-----	0-3	75-80	13	4-8	1.55-1.65	14.2-19.8	0.00-0.00	0.0-0.1	0.0-0.5
	3-4	75-87	5-21	4-8	1.55-1.65	7.1-14.2	0.03-0.05	0.1-0.4	0.0-0.5
	4-14	55-78	4-37	8-18	1.50-1.60	2.8-9.9	0.06-0.08	0.2-1.1	0.0-0.3
	14-19	55-78	4-37	8-18	1.50-1.60	2.8-9.9	0.06-0.08	0.2-1.1	0.0-0.3
	19-29	---	---	---	---	0.0-0.0	0.00-0.00	---	---
Lostpalms-----	0-1	85	10	3-10	1.60-1.70	7.1-14.2	0.06-0.09	0.1-0.7	0.0-0.5
	1-7	85	9	3-10	1.55-1.65	7.1-14.2	0.05-0.07	0.1-0.5	0.0-0.3
	7-17	---	---	---	---	0.0-0.1	0.00-0.01	---	---

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties

(Entries under "Erosion factors" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1220:						
Jadestorm-----	0-2	.02	.24	1	8	0
	2-3	.05	.24			
	3-10	.05	.28			
	10-17	---	---			
	17-26	---	---			
Blackeagle, cool-----	0-2	.02	.17	1	8	0
	2-3	.05	.28			
	3-11	.05	.28			
	11-18	.10	.32			
	18-30	---	---			
Rock outcrop.						
1225:						
Blackeagle-----	0-3	.02	.28	1	8	0
	3-4	.05	.37			
	4-14	.10	.32			
	14-24	---	---			
Rock outcrop.						
1230:						
Jadestorm-----	0-3	.02	.32	2	8	0
	3-7	.10	.37			
	7-11	.05	.28			
	11-20	---	---			
	20-30	---	---			
Jadestorm, cool-----	0-2	.02	.37	1	8	0
	2-3	.17	.37			
	3-10	.05	.28			
	10-17	---	---			
	17-26	---	---			
Rock outcrop.						
1240:						
Meccapass-----	0-1	.02	.20	3	8	0
	1-2	.20	.32			
	2-16	.10	.43			
	16-37	.05	.28			
	37-59	---	---			
Bulletproof-----	0-3	.02	.15	2	8	0
	3-6	.17	.24			
	6-11	.17	.17			
	11-59	---	---			
Rock outcrop.						
1241:						
Meccapass-----	0-1	.02	.24	3	8	0
	1-2	.15	.24			
	2-16	.10	.43			
	16-27	.05	.37			
	27-59	---	---			



# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1241:						
Seanna-----	0-1	.17	.28	2	5	56
	1-12	.20	.32			
	12-59	---	---			
Contactmine, dry-----	0-2	.17	.28	3	5	56
	2-6	.15	.15			
	6-11	.20	.28			
	11-25	.20	.37			
	25-59	---	---			
1242:						
Meccapass-----	0-1	.02	.24	3	8	0
	1-2	.15	.32			
	2-16	.10	.43			
	16-27	.05	.37			
	27-59	---	---			
Jadestorm-----	0-2	.02	.32	1	8	0
	2-3	.20	.37			
	3-8	.05	.28			
	8-20	---	---			
	20-30	---	---			
Rock outcrop.						
1250:						
Ironlung-----	0-2	.05	.15	1	2	134
	2-6	.02	.02			
	6-59	---	---			
Ironlung, cool-----	0-1	.05	.15	1	2	134
	1-4	.02	.02			
	4-59	---	---			
Rock outcrop.						
1255:						
Goldenhills-----	0-2	.02	.10	3	6	48
	2-3	.05	.20			
	3-10	.10	.24			
	10-26	.10	.24			
	26-47	.02	.10			
	47-57	---	---			
Bulletproof-----	0-2	.02	.15	2	6	48
	2-3	.10	.24			
	3-5	.28	.28			
	5-14	.24	.24			
	14-59	---	---			
Fanhill-----	0-5	.02	.24	2	8	0
	5-6	.32	.32			
	6-15	.15	.28			
	15-18	.10	.17			
	18-59	---	---			
Whiterobe-----	0-1	.02	.10	3	6	48
	1-2	.05	.20			
	2-12	.10	.24			
	12-26	.15	.15			
	26-59	---	---			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1260:						
Whiterobe-----	0-1	.05	.20	3	3	86
	1-11	.10	.24			
	11-24	.15	.15			
	24-59	---	---			
Bigbernie-----	0-1	.10	.24	3	2	134
	1-4	.10	.24			
	4-24	.05	.17			
	24-59	---	---			
Whiterobe, cool-----	0-1	.05	.20	3	3	86
	1-11	.10	.24			
	11-24	.15	.15			
	24-59	---	---			
1410:						
Missionwell-----	0-2	.02	.24	1	8	0
	2-3	.10	.37			
	3-8	.10	.43			
	8-18	---	---			
Rock outcrop.						
Missionwell, high elevation-----	0-2	.02	.32	1	8	0
	2-3	.15	.43			
	3-8	.10	.43			
	8-18	---	---			
1415:						
Bolero-----	0-6	.02	.32	1	8	0
	6-7	.15	.43			
	7-12	.15	.37			
	12-15	.10	.37			
	15-19	.02	.37			
	19-29	---	---			
Rock outcrop.						
1504:						
Rizzo, rarely flooded, stony-----	0-1	.37	.37	5	2	134
	1-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			
Rizzo, occasionally flooded, stony-----	0-2	.05	.10	5	2	134
	2-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			
1510:						
Carrizo, very gravelly sandy loam-----	0-1	.05	.24	5	6	48
	1-5	.05	.17			
	5-13	.05	.15			
	13-59	.02	.02			
1511:						
Carrizo, channeled-----	0-1	.24	.24	5	2	134
	1-5	.05	.10			
	5-13	.05	.15			
	13-59	.02	.02			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1511: Carrizo, occasionally flooded-----	0-1	.05	.20	5	3	86
	1-5	.05	.10			
	5-13	.05	.15			
	13-59	.02	.02			
1512: Carrizo, extremely gravelly sandy loam----	0-1	.02	.10	5	8	0
	1-4	.02	.02			
	4-59	.02	.10			
1513: Carrizo-----	0-1	.28	.28	5	3	86
	1-5	.05	.17			
	5-13	.05	.15			
	13-59	.02	.02			
Carrizo, occasionally flooded, channeled-----	0-1	.05	.24	5	6	48
	1-5	.05	.17			
	5-13	.05	.15			
	13-59	.02	.02			
Rubylee-----	0-2	.28	.28	5	3	86
	2-5	.10	.17			
	5-18	.10	.17			
	18-59	.10	.24			
1514: Carrizo, rarely flooded-	0-1	.10	.24	5	2	134
	1-5	.02	.05			
	5-59	.02	.02			
Pintobasin, fine sandy loam-----	0-2	.28	.28	5	3	86
	2-4	.05	.10			
	4-24	.32	.32			
	24-59	.24	.24			
Rubylee-----	0-2	.28	.28	5	3	86
	2-5	.10	.17			
	5-18	.10	.17			
	18-59	.10	.24			
1515: Pintobasin-----	0-2	.20	.32	5	2	134
	2-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
Carrizo, occasionally flooded-----	0-1	.05	.20	5	3	86
	1-5	.05	.10			
	5-13	.05	.15			
	13-59	.02	.02			
1516: Pintobasin, fine sandy loam-----	0-2	.28	.28	5	3	86
	2-4	.05	.10			
	4-24	.32	.32			
	24-59	.24	.24			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1517:						
Pintobasin-----	0-1	.17	.17	5	1	250
	1-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
Dalelake-----	0-4	.15	.15	5	1	250
	4-59	.02	.02			
1520:						
Pintobasin, loamy sand--	0-2	.28	.28	5	2	134
	2-14	.24	.24			
	14-35	.02	.02			
	35-59	.02	.02			
1522:						
Pintobasin, rarely flooded-----	0-2	.10	.10	5	1	220
	2-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
1523:						
Pintobasin, rarely flooded-----	0-2	.10	.10	5	1	220
	2-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
Aquapeak-----	0-0	.10	.24	2	2	134
	0-11	.32	.32			
	11-19	.17	.32			
	19-33	.10	.20			
	33-59	.02	.02			
Pintobasin, occasionally flooded-----	0-2	.10	.10	5	1	220
	2-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
1524:						
Pintobasin, rarely flooded-----	0-2	.10	.10	5	1	220
	2-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
1525:						
Pintobasin, occasionally flooded-----	0-2	.10	.10	5	1	220
	2-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
Pintobasin, rarely flooded-----	0-2	.28	.28	5	2	134
	2-14	.24	.24			
	14-35	.02	.02			
	35-59	.02	.02			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1526:						
Pintobasin, rarely flooded-----	0-3	.28	.28	5	2	134
	3-7	.24	.24			
	7-20	.05	.10			
	20-59	.10	.10			
Joetree-----	0-2	.24	.24	5	2	134
	2-43	.20	.20			
	43-65	.28	.28			
	65-71	.17	.17			
Patscamp-----	0-1	.37	.37	5	2	134
	1-10	.02	.05			
	10-17	.28	.28			
	17-35	.17	.28			
	35-45	.24	.24			
	45-53	.24	.24			
	53-63	.10	.17			
1527:						
Pintobasin, moist-----	0-2	.28	.28	5	2	134
	2-14	.24	.24			
	14-35	.02	.02			
	35-59	.02	.02			
1530:						
Dalelake, fine sand-----	0-4	.15	.15	5	1	250
	4-59	.02	.02			
1531:						
Dalelake-----	0-2	.15	.15	5	1	250
	2-13	.02	.02			
	13-22	.02	.02			
	22-59	.02	.02			
Pintobasin, rarely flooded-----	0-2	.10	.10	5	1	220
	2-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
1540:						
Carizzo, very rarely flooded-----	0-1	.05	.20	5	6	48
	1-5	.05	.20			
	5-13	.05	.15			
	13-59	.02	.02			
Carrizo, stable-----	0-1	.28	.28	5	3	86
	1-5	.05	.17			
	5-13	.05	.15			
	13-59	.02	.02			
Carizzo, occasionally flooded, rock surface--	0-1	.10	.24	5	2	134
	1-5	.02	.05			
	5-59	.02	.02			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
1540:						
Russiroks-----	0-1	.02	.55	5	8	0
	1-2	.37	.55			
	2-7	.17	.43			
	7-30	.05	.24			
	30-59	.02	.20			
1541:						
Carrizo, stable-----	0-1	.28	.28	5	3	86
	1-5	.05	.17			
	5-13	.05	.15			
	13-59	.02	.02			
Cambidic Haplodurids----	0-2	.02	.32	2	8	0
	2-2	.24	.43			
	2-5	.24	.32			
	5-16	.05	.24			
	16-20	.20	.20			
	20-59	.05	.17			
1542:						
Carrizo, very rarely flooded-----	0-1	.28	.28	5	3	86
	1-5	.05	.20			
	5-13	.05	.15			
	13-59	.02	.02			
Carizzo, occasionally flooded-----	0-1	.05	.20	5	3	86
	1-5	.05	.10			
	5-13	.05	.15			
	13-59	.02	.02			
1550:						
Buzzardsprings, stable--	0-3	.28	.28	5	3	86
	3-25	.15	.24			
	25-59	.05	.10			
Coxpin-----	0-1	.43	.43	2	2	134
	1-10	.24	.32			
	10-17	.17	.32			
	17-22	.20	.20			
	22-59	.10	.10			
Dalelake-----	0-4	.15	.15	5	1	250
	4-59	.02	.02			
1555:						
Goldrose-----	0-1	.20	.28	5	2	134
	1-6	.02	.02			
	6-21	.02	.02			
	21-31	.02	.02			
	31-59	.02	.02			
Carsitas, very rarely flooded-----	0-1	.05	.10	5	1	220
	1-59	.05	.10			
Chemwash, rarely flooded	0-2	.10	.15	5	2	134
	2-67	.02	.05			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2003:						
Emptygun-----	0-2	.10	.28	5	3	86
	2-10	.10	.24			
	10-20	.10	.24			
	20-60	.10	.24			
2060:						
Joetree, very rarely flooded-----	0-2	.32	.32	5	2	134
	2-39	.10	.10			
	39-59	.28	.28			
	59-71	.17	.17			
Dalelake-----	0-4	.15	.15	5	1	250
	4-59	.02	.02			
Pintobasin, fine sandy loam-----	0-2	.28	.28	5	3	86
	2-4	.05	.10			
	4-24	.32	.32			
	24-59	.24	.24			
2065:						
Dalelake-----	0-4	.15	.15	5	1	250
	4-59	.02	.02			
Aquapeak-----	0-2	.02	.28	2	8	0
	2-3	.20	.37			
	3-11	.32	.32			
	11-19	.17	.32			
	19-33	.10	.20			
	33-59	.02	.02			
Coxpin-----	0-1	.24	.24	2	1	250
	1-10	.24	.32			
	10-17	.17	.32			
	17-22	.20	.20			
	22-59	.10	.10			
2067:						
Aquapeak, overblown----	0-4	.20	.49	2	7	38
	4-9	.43	.43			
	9-13	.32	.32			
	13-19	.24	.32			
	19-43	.10	.15			
	43-47	.20	.37			
	47-59	.02	.02			
Buzzardsprings-----	0-1	.10	.15	5	1	250
	1-3	.28	.28			
	3-8	.28	.28			
	8-23	.10	.10			
	23-60	.02	.02			
Dalelake, thick sandy surface-----	0-2	.15	.15	5	1	250
	2-13	.02	.02			
	13-22	.02	.02			
	22-59	.02	.02			
Buzzardsprings, steep---	0-1	.10	.17	5	2	134
	1-3	.28	.28			
	3-8	.28	.28			
	8-23	.10	.10			
	23-60	.02	.02			

Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2068:						
Aquapeak-----	0-0	.10	.24	2	2	134
	0-11	.32	.32			
	11-19	.17	.32			
	19-33	.10	.20			
	33-59	.02	.02			
Carpetflat, nongravelly surface-----	0-0	.05	.15	1	1	250
	0-4	.20	.32			
	4-15	.32	.32			
	15-61	.02	.02			
Pintobasin-----	0-1	.17	.17	5	1	250
	1-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
2070:						
Missionsweet-----	0-2	.02	.49	1	8	0
	2-3	.20	.55			
	3-11	.10	.55			
	11-17	.05	.49			
	17-27	---	---			
Carpetflat-----	0-2	.02	.43	1	8	0
	2-4	.37	.55			
	4-7	.10	.32			
	7-13	.15	.37			
	13-16	.37	.37			
	16-26	---	---			
2075:						
Oldale-----	0-2	.05	.43	5	8	0
	2-3	.17	.49			
	3-6	.28	.49			
	6-15	.10	.32			
	15-27	.05	.20			
	27-59	.05	.15			
Missionsweet-----	0-2	.02	.49	1	8	0
	2-3	.20	.55			
	3-11	.10	.55			
	11-17	.05	.49			
	17-27	---	---			
2076:						
Oldale-----	0-2	.02	.32	5	8	0
	2-4	.10	.43			
	4-7	.28	.49			
	7-16	.10	.32			
	16-28	.05	.20			
	28-59	.05	.15			
Carrizo-----	0-1	.05	.24	5	6	48
	1-5	.05	.20			
	5-13	.05	.15			
	13-59	.02	.02			



# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2077:						
Oldale-----	0-2	.02	.43	5	8	0
	2-3	.17	.49			
	3-6	.28	.49			
	6-9	.10	.32			
	9-16	.05	.20			
	16-59	.05	.15			
Carrizo-----	0-1	.28	.28	5	3	86
	1-5	.05	.17			
	5-13	.05	.15			
	13-59	.02	.02			
Carrizo, very rarely flooded-----	0-1	.05	.20	5	6	48
	1-5	.05	.20			
	5-13	.05	.15			
	13-59	.02	.02			
2085:						
Rainbowsend-----	0-6	.02	.32	1	8	0
	6-7	.15	.32			
	7-15	.10	.43			
	15-18	.15	.37			
	18-28	---	---			
Goldenbell-----	0-2	.02	.28	2	8	0
	2-3	.05	.37			
	3-11	.10	.24			
	11-16	.02	.05			
	16-59	.02	.05			
2090:						
Deprave-----	0-2	.02	.32	3	8	0
	2-4	.20	.43			
	4-15	.10	.28			
	15-39	.05	.15			
	39-63	.02	.10			
Rockhound-----	0-2	.02	.32	5	8	0
	2-4	.17	.43			
	4-7	.10	.37			
	7-17	.17	.32			
	17-34	.05	.24			
	34-59	.05	.17			
Rizzo-----	0-1	.02	.24	5	8	0
	1-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			
2091:						
Deprave-----	0-1	.02	.32	3	8	0
	1-2	.20	.43			
	2-13	.10	.28			
	13-24	.05	.15			
	24-63	.02	.10			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2091:						
Roostertail-----	0-1	.02	.24	3	8	0
	1-2	.10	.32			
	2-4	.05	.24			
	4-29	.10	.24			
	29-56	.02	.02			
	56-60	---	---			
	60-69	.02	.02			
2100:						
Perurose-----	0-2	.02	.20	3	8	0
	2-3	.28	.28			
	3-7	.28	.28			
	7-18	.17	.17			
	18-30	.24	.24			
	30-43	.20	.20			
	43-61	.02	.02			
Coxpin-----	0-2	.43	.43	2	3	86
	2-10	.43	.43			
	10-17	.17	.32			
	17-22	.20	.20			
	22-59	.28	.28			
Pintobasin, gravelly surface-----	0-2	.28	.28	5	2	134
	2-14	.24	.24			
	14-35	.02	.02			
	35-59	.02	.02			
2101:						
Perurose, rarely flooded	0-1	.10	.10	3	1	220
	1-5	.28	.28			
	5-16	.17	.17			
	16-28	.24	.24			
	28-41	.20	.20			
	41-59	.02	.02			
Pintobasin, rarely flooded-----	0-2	.10	.10	5	1	220
	2-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
2110:						
Descent-----	0-2	.02	.28	5	6	48
	2-2	.20	.28			
	2-7	.05	.32			
	7-17	.05	.24			
	17-59	.02	.05			
Descent, stable-----	0-0	.02	.32	5	8	0
	0-1	.17	.32			
	1-7	.05	.32			
	7-17	.05	.24			
	17-59	.02	.05			
2111:						
Descent, warm-----	0-2	.02	.28	5	6	48
	2-2	.20	.28			
	2-7	.05	.32			
	7-17	.05	.24			
	17-59	.02	.05			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2111: Rubylee, very rarely flooded-----	0-2	.28	.28	5	3	86
	2-5	.10	.17			
	5-18	.10	.17			
	18-59	.10	.24			
2120: Rizzo, rarely flooded---	0-1	.37	.37	5	2	134
	1-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			
Deprave-----	0-1	.02	.32	3	8	0
	1-2	.20	.43			
	2-13	.10	.28			
	13-33	.05	.15			
	33-63	.02	.10			
Rizzo, frequently flooded-----	0-4	.02	.05	5	1	160
	4-12	.05	.10			
	12-59	.02	.02			
2121: Rizzo, rubbly-----	0-1	.05	.17	5	6	48
	1-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			
2130: Goldenbell-----	0-2	.02	.37	2	8	0
	2-3	.49	.49			
	3-11	.15	.37			
	11-16	.02	.05			
	16-59	.02	.05			
Descent-----	0-1	.28	.28	5	2	134
	1-7	.05	.32			
	7-17	.05	.24			
	17-59	.02	.05			
2140: Rockhound, cobbly-----	0-3	.02	.37	5	8	0
	3-4	.37	.55			
	4-34	.05	.17			
	34-59	.05	.10			
2402: Rizzo-----	0-2	.05	.10	5	2	134
	2-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			
Rizzo, frequently flooded-----	0-1	.02	.05	5	5	56
	1-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2403:						
Rizzo-----	0-1	.10	.28	5	6	48
	1-7	.05	.15			
	7-20	.05	.10			
	20-59	.02	.02			
Rizzo, occasionally flooded-----	0-4	.02	.05	5	1	160
	4-12	.05	.10			
	12-59	.02	.02			
2404:						
Rizzo, occasionally flooded-----	0-2	.05	.10	5	2	134
	2-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			
Rizzo, very rarely flooded-----	0-1	.37	.37	5	2	134
	1-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			
2405:						
Carrizo, rarely flooded-	0-1	.10	.24	5	2	134
	1-5	.02	.05			
	5-59	.02	.02			
Carrizo, occasionally flooded-----	0-1	.05	.20	5	3	86
	1-5	.05	.10			
	5-13	.05	.15			
	13-59	.02	.02			
2406:						
Pintobasin, frequently flooded-----	0-3	.05	.10	5	1	220
	3-19	.05	.10			
	19-59	.05	.05			
Carrizo, occasionally flooded-----	0-1	.05	.20	5	3	86
	1-5	.05	.10			
	5-13	.05	.15			
	13-59	.02	.02			
2407:						
Pintobasin, rarely flooded-----	0-2	.10	.10	5	1	220
	2-4	.05	.10			
	4-24	.05	.10			
	24-59	.05	.10			
Carrizo, occasionally flooded-----	0-1	.05	.20	5	3	86
	1-5	.05	.10			
	5-13	.05	.15			
	13-59	.02	.02			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2407: Carrizo, frequently flooded-----	0-1 1-5 5-13 13-59	.15 .05 .05 .02	.15 .10 .15 .02	5	1	220
2408: Rizzo, frequently flooded-----	0-4 4-12 12-59	.02 .05 .02	.05 .10 .02	5	1	160
Rizzo, very rarely flooded-----	0-2 2-9 9-19 19-59	.05 .05 .05 .02	.10 .15 .10 .02	5	2	134
2409: Rizzo, frequently flooded-----	0-1 1-4 4-12 12-59	.17 .02 .05 .02	.32 .05 .10 .02	5	2	134
Chemwash, frequently flooded-----	0-2 2-67	.02 .02	.10 .02	5	2	134
Chemwash, occasionally flooded, braided-----	0-1 1-59	.10 .05	.17 .10	5	2	134
2420: Carsitas, frequently flooded-----	0-1 1-59	.05 .05	.10 .10	5	1	220
Carsitas, occasionally flooded-----	0-1 1-59	.05 .05	.10 .10	5	1	220
Carsitas, rarely flooded	0-1 1-59	.24 .05	.24 .10	5	3	86
2421: Carsitas, very rarely flooded-----	0-1 1-59	.17 .05	.24 .10	5	2	134
Carsitas, rarely flooded	0-1 1-59	.24 .05	.24 .10	5	3	86
2431: Chemwash, frequently flooded, braided-----	0-2 2-67	.02 .02	.10 .02	5	2	134
Chemwash, frequently flooded-----	0-2 2-67	.02 .02	.10 .02	5	2	134

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2440:						
Rizzo-----	0-1	.17	.32	5	2	134
	1-4	.02	.05			
	4-12	.05	.10			
	12-59	.02	.02			
Rizzo, occasionally flooded-----	0-1	.02	.05	5	5	56
	1-4	.02	.05			
	4-12	.05	.10			
	12-59	.02	.02			
Rizzo, extremely stony--	0-1	.02	.24	5	8	0
	1-9	.05	.15			
	9-19	.05	.10			
	19-59	.02	.02			
2715:						
Dalelake-----	0-2	.15	.15	5	1	250
	2-59	.02	.02			
Sheephole-----	0-1	.10	.10	4	1	250
	1-6	.10	.10			
	6-22	.10	.10			
	22-29	.10	.10			
	29-42	.02	.02			
	42-59	.02	.02			
Pintobasin-----	0-1	.17	.17	5	1	250
	1-8	.05	.05			
	8-24	.05	.10			
	24-59	.05	.10			
2716:						
Dalelake, steep-----	0-4	.15	.15	5	1	250
	4-59	.02	.02			
Dalelake-----	0-4	.15	.15	5	1	250
	4-59	.02	.02			
2717:						
Dalelake-----	0-4	.15	.15	5	1	250
	4-59	.02	.02			
Rock outcrop.						
Buzzardsprings, fine sand-----	0-2	.37	.37	5	2	134
	2-3	.28	.28			
	3-8	.28	.28			
	8-23	.10	.10			
	23-60	.02	.02			
2718:						
Dalelake-----	0-4	.15	.15	5	1	250
	4-59	.02	.02			
Sheephole, gravelly surface-----	0-1	.10	.10	5	1	250
	1-6	.10	.10			
	6-22	.10	.10			
	22-29	.10	.10			
	29-42	.02	.02			
	42-59	.02	.02			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2820: Rock outcrop.						
Impedimenta-----	0-1	.17	.32	1	2	134
	1-4	.10	.20			
	4-14	---	---			
2825: Rock outcrop.						
Supplymine-----	0-6	.02	.20	2	8	0
	6-7	.15	.32			
	7-20	.10	.32			
	20-33	.15	.37			
	33-43	---	---			
Bolero, dry-----	0-6	.02	.32	1	8	0
	6-7	.10	.43			
	7-12	.15	.37			
	12-15	.10	.37			
	15-19	.02	.37			
	19-29	---	---			
Ironage-----	0-6	.02	.17	2	8	0
	6-9	.15	.37			
	9-13	.15	.37			
	13-18	.05	.37			
	18-24	.05	.32			
	24-33	---	---			
2830: Rock outcrop.						
Blackeagle, cool-----	0-8	.02	.28	1	8	0
	8-9	.10	.37			
	9-16	.10	.32			
	16-30	---	---			
2835: Rock outcrop.						
Blackeagle-----	0-5	.02	.32	1	8	0
	5-7	.15	.43			
	7-17	.17	.43			
	17-27	---	---			
2840: Rock outcrop.						
Jadestorm-----	0-2	.02	.37	1	8	0
	2-3	.17	.37			
	3-10	.05	.28			
	10-17	---	---			
	17-26	---	---			
3110: Coppermine, cool-----	0-1	.28	.28	1	3	86
	1-4	.17	.28			
	4-8	.10	.28			
	8-11	.05	.24			
	11-20	---	---			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
2840:						
Stranger-----	0-1	.20	.37	1	2	134
	1-3	.20	.20			
	3-13	---	---			
3120:						
Aguilareal-----	0-3	.02	.20	1	8	0
	3-4	.10	.43			
	4-14	.15	.37			
	14-19	.15	.37			
	19-29	---	---			
Blackeagle-----	0-5	.02	.32	1	8	0
	5-7	.15	.43			
	7-17	.17	.43			
	17-27	---	---			
Rock outcrop.						
3213:						
Dalvord-----	0-2	.02	.32	1	8	0
	2-3	.28	.43			
	3-5	.43	.43			
	5-14	.02	.43			
	14-24	---	---			
Aguilareal-----	0-3	.02	.20	1	8	0
	3-5	.15	.28			
	5-14	.15	.37			
	14-19	.15	.37			
	19-29	---	---			
Rock outcrop.						
3242:						
Langwell-----	0-1	.15	.32	1	5	56
	1-4	.17	.32			
	4-14	---	---			
Rock outcrop.						
Helendale, cool-----	0-10	.20	.20	5	2	134
	10-37	.24	.24			
	37-59	.20	.20			
3285:						
Pinecity-----	0-1	.15	.28	1	2	134
	1-7	.24	.37			
	7-59	---	---			
Contactmine-----	0-1	.20	.20	3	3	86
	1-5	.15	.15			
	5-9	.20	.28			
	9-22	.20	.37			
	22-26	.05	.32			
	26-59	---	---			
Desertqueen-----	0-4	.28	.28	2	3	86
	4-11	.17	.28			
	11-59	---	---			
Rock outcrop.						



# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
3286: Pinecity, gravelly loamy sand-----	0-2 2-4 4-59	.17 .24 ---	.32 .32 ---	1	2	134
3291: Smithcanyon-----	0-3 3-59	.24 ---	.37 ---	1	2	134
Stubbespring-----	0-1 1-4 4-13 13-59	.15 .15 .20 ---	.15 .15 .32 ---	2	1	180
Rock outcrop.						
3292: Smithcanyon-----	0-2 2-7 7-59	.15 .10 ---	.24 .24 ---	1	2	134
Pinecity-----	0-2 2-7 7-59	.20 .17 ---	.32 .32 ---	1	2	134
Rock outcrop.						
3293: Smithcanyon-----	0-1 1-7 7-59	.10 .10 ---	.15 .28 ---	1	1	220
Pinecity-----	0-2 2-7 7-59	.17 .15 ---	.28 .28 ---	1	2	134
3294: Smithcanyon, dry-----	0-1 1-9 9-59	.10 .10 ---	.15 .24 ---	1	1	220
3295: Desertqueen, dry-----	0-4 4-11 11-59	.28 .17 ---	.28 .28 ---	2	3	86
Hexie-----	0-1 1-5 5-9 9-39 39-59	.10 .17 .10 .28 ---	.28 .24 .20 .28 ---	3	6	48
Rock outcrop.						
3296: Desertqueen-----	0-2 2-5 5-13 13-59	.05 .15 .15 ---	.15 .28 .24 ---	2	1	220
Pinecity-----	0-2 2-6 6-59	.20 .20 ---	.20 .20 ---	1	1	220

Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
3297:						
Desertqueen, warm-----	0-2	.28	.28	1	3	86
	2-5	.28	.28			
	5-59	---	---			
Contactmine, dry-----	0-2	.20	.32	4	5	56
	2-5	.10	.24			
	5-12	.37	.37			
	12-22	.37	.37			
	22-47	.28	.28			
	47-59	---	---			
Seanna, dry-----	0-1	.17	.28	2	5	56
	1-8	.20	.32			
	8-15	.37	.37			
	15-59	---	---			
3325:						
Ironped, warm-----	0-2	.10	.15	1	1	220
	2-7	.05	.15			
	7-59	---	---			
Rock outcrop.						
Hexie-----	0-3	.15	.24	3	5	56
	3-13	.20	.20			
	13-35	.15	.20			
	35-59	---	---			
Ironped-----	0-2	.10	.15	1	1	220
	2-7	.05	.15			
	7-59	---	---			
3335:						
Xeric Torriorthents----	0-9	.15	.20	4	2	134
	9-26	.05	.15			
	26-36	.02	.15			
	36-50	.05	.05			
	50-59	---	---			
Rock outcrop.						
Xeric Torriorthents, warm----	0-9	.15	.20	4	2	134
	9-26	.05	.15			
	26-36	.02	.15			
	36-50	.05	.05			
	50-59	---	---			
3336:						
Xeric Torriorthents----	0-9	.15	.20	4	2	134
	9-26	.05	.15			
	26-36	.02	.15			
	36-50	.05	.05			
	50-59	---	---			
Bigbernie-----	0-1	.10	.24	3	2	134
	1-4	.10	.24			
	4-24	.05	.17			
	24-59	---	---			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
3340:						
Seanna-----	0-1	.32	.32	2	3	86
	1-6	.20	.32			
	6-17	.15	.37			
	17-59	---	---			
Grubstake, moist-----	0-2	.02	.17	2	8	0
	2-3	.20	.28			
	3-18	.28	.28			
	18-30	---	---			
	30-39	---	---			
Pinecity-----	0-2	.32	.32	1	2	134
	2-9	.32	.32			
	9-59	---	---			
3345:						
Bigcanyon-----	0-0	.05	.05	3	1	220
	0-14	.05	.05			
	14-20	.10	.10			
	20-59	---	---			
Bigcanyon, cool-----	0-1	.10	.10	3	1	220
	1-9	.02	.02			
	9-23	.05	.05			
	23-59	---	---			
3440:						
Pacific Mesa, steep-----	0-3	.20	.49	1	5	56
	3-9	.17	.43			
	9-16	.10	.49			
	16-26	---	---			
Pacific Mesa-----	0-0	.64	.64	1	5	56
	0-2	.64	.64			
	2-9	.17	.43			
	9-17	.10	.49			
	17-26	---	---			
3509:						
Cajon, very rarely flooded-----	0-1	.10	.10	5	1	220
	1-19	.24	.24			
	19-38	.10	.15			
	38-59	.02	.02			
Friedliver-----	0-1	.05	.15	5	3	86
	1-16	.05	.10			
	16-33	.20	.37			
	33-59	.15	.24			
3525:						
Cajon-----	0-1	.05	.10	5	1	220
	1-4	.02	.02			
	4-20	.02	.02			
	20-59	.02	.02			
Friedliver-----	0-1	.05	.10	5	1	220
	1-5	.02	.02			
	5-16	.02	.02			
	16-32	.24	.24			
	32-39	.20	.20			
	39-59	.05	.10			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
3526:						
Cajon-----	0-1	.10	.17	5	2	134
	1-33	.15	.20			
	33-61	.02	.05			
Hypoint-----	0-1	.28	.28	3	2	134
	1-19	.15	.15			
	19-59	.05	.10			
Arizo, occasionally flooded-----	0-2	.05	.10	5	1	160
	2-10	.02	.02			
	10-59	.02	.02			
3611:						
Burntshack, sand surface	0-2	.10	.10	5	1	180
	2-7	.10	.10			
	7-12	.10	.10			
	12-30	.10	.10			
	30-39	.20	.20			
	39-59	.05	.05			
Burntshack-----	0-2	.10	.10	5	1	220
	2-7	.10	.10			
	7-12	.10	.10			
	12-30	.10	.10			
	30-39	.20	.20			
	39-59	.05	.05			
3612:						
Burntshack-----	0-2	.10	.10	5	1	220
	2-17	.10	.10			
	17-27	.10	.10			
	27-59	.15	.20			
Burntshack, occasionally flooded-----	0-2	.05	.10	5	1	220
	2-17	.02	.02			
	17-27	.10	.10			
	27-59	.15	.20			
3676:						
Morongo, loamy sand, very rarely flooded----	0-0	.24	.24	5	2	134
	0-20	.24	.24			
	20-60	.24	.24			
3677:						
Morongo-----	0-1	.10	.10	5	1	220
	1-6	.10	.10			
	6-28	.10	.10			
	28-59	.02	.02			
3679:						
Morongo, cool-----	0-2	.05	.05	5	1	220
	2-6	.02	.02			
	6-19	.20	.20			
	19-59	.20	.20			
Jumborox-----	0-1	.10	.10	5	1	220
	1-4	.20	.20			
	4-14	.20	.20			
	14-22	.20	.20			
	22-37	.17	.17			
	37-71	.20	.20			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
3680: Morongo-----	0-1	.15	.15	5	2	134
	1-2	.10	.10			
	2-35	.10	.10			
	35-59	.02	.02			
3681: Morongo, very rarely flooded-----	0-1	.10	.10	5	1	220
	1-6	.10	.10			
	6-28	.10	.10			
	28-59	.02	.02			
Jumborox, dry-----	0-1	.10	.10	5	1	220
	1-4	.20	.20			
	4-14	.20	.20			
	14-22	.20	.20			
	22-37	.17	.17			
	37-71	.20	.20			
3682: Morongo, cool-----	0-2	.05	.05	5	1	220
	2-6	.02	.02			
	6-19	.20	.20			
	19-59	.20	.20			
Jumborox-----	0-2	.24	.24	5	2	134
	2-8	.20	.20			
	8-21	.15	.15			
	21-33	.15	.15			
	33-59	.10	.10			
Urban land.						
3683: Morongo-----	0-1	.20	.20	5	2	134
	1-59	.02	.02			
Bluecut, very rarely flooded-----	0-1	.32	.32	5	3	86
	1-12	.15	.24			
	12-26	.10	.15			
	26-33	.10	.20			
	33-59	.10	.20			
3684: Morongo, warm-----	0-1	.17	.17	5	2	134
	1-5	.10	.20			
	5-16	.05	.05			
	16-79	.05	.05			
3685: Morongo, cool-----	0-2	.05	.05	5	1	220
	2-6	.02	.02			
	6-19	.20	.20			
	19-59	.20	.20			
Desertqueen, undulating-	0-3	.28	.28	2	2	134
	3-12	.17	.24			
	12-59	---	---			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
3690: Nasagold-----	0-1	.15	.20	5	2	134
	1-6	.10	.17			
	6-20	.10	.15			
	20-37	.10	.17			
	37-59	.15	.20			
3695: Gocougs-----	0-2	.24	.24	3	2	134
	2-6	.17	.17			
	6-33	.20	.32			
	33-46	.17	.28			
	46-65	.05	.10			
4031: Crosgrain-----	0-1	.17	.32	1	5	56
	1-6	.15	.32			
	6-13	.10	.37			
	13-22	---	---			
Crackerjack-----	0-1	.20	.37	2	5	56
	1-7	.28	.55			
	7-13	.20	.43			
	13-59	.15	.37			
Pinkcan, dry-----	0-0	.28	.28	4	3	86
	0-11	.20	.20			
	11-19	.24	.24			
	19-25	.32	.32			
	25-28	.20	.20			
	28-33	.15	.32			
	33-47	.20	.32			
	47-60	.32	.32			
4041: Silvermine-----	0-1	.28	.28	1	2	134
	1-7	.20	.28			
	7-55	.20	.32			
	55-59	.17	.17			
Helendale-----	0-2	.24	.24	5	3	86
	2-16	.24	.24			
	16-59	.05	.10			
Burntshack, very rarely flooded-----	0-2	.10	.10	5	1	220
	2-31	.20	.20			
	31-43	.24	.24			
	43-51	.20	.20			
	51-59	.20	.20			
4064: Gravesumit-----	0-1	.32	.32	5	2	134
	1-7	.32	.32			
	7-13	.24	.24			
	13-29	.24	.24			
	29-41	.02	.02			
	41-45	.17	.17			
	45-60	.02	.02			
Helendale, sandy surface	0-10	.20	.20	5	2	134
	10-37	.24	.24			
	37-59	.20	.20			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
4071:						
Helendale-----	0-4	.32	.32	5	8	0
	4-37	.24	.24			
	37-59	.20	.20			
Desertqueen, very rarely flooded-----	0-2	.28	.28	2	3	86
	2-5	.17	.24			
	5-12	.20	.20			
	12-14	.02	.15			
	14-59	---	---			
4091:						
Littlefargo-----	0-1	.24	.24	3	2	134
	1-4	.28	.28			
	4-31	.24	.24			
	31-34	.37	.37			
	34-59	---	---			
4245:						
Bluecut-----	0-4	.28	.28	5	2	134
	4-11	.17	.17			
	11-21	.20	.20			
	21-26	.24	.24			
	26-49	.05	.15			
	49-79	.15	.15			
Morongo, very rarely flooded-----	0-1	.10	.10	5	1	220
	1-6	.10	.10			
	6-28	.10	.10			
	28-59	.02	.02			
Yander, very rarely flooded-----	0-2	.24	.24	4	2	134
	2-23	.15	.24			
	23-40	.02	.05			
	40-79	---	---			
4260:						
Minhoyt-----	0-1	.43	.43	1	5	56
	1-2	.20	.32			
	2-12	.28	.28			
	12-59	---	---			
Corbilt, rarely flooded-	0-6	.02	.02	4	1	220
	6-14	.05	.05			
	14-51	.24	.24			
	51-59	.32	.32			
4265:						
Werewolf, warm-----	0-2	.20	.32	3	5	56
	2-19	.10	.28			
	19-24	.05	.20			
	24-30	.05	.24			
	30-59	.05	.17			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
4270: Yuccabutte, extremely cobble sandy loam-----	0-2	.17	.43	4	7	38
	2-16	.02	.43			
	16-30	.05	.24			
	30-39	.05	.10			
	39-53	.24	.24			
	53-60	.15	.20			
4271: Yuccabutte, warm-----	0-0	.43	.43	4	6	48
	0-6	.20	.37			
	6-20	.05	.20			
	20-39	.05	.10			
	39-53	.24	.24			
	53-60	.15	.20			
Arizo, rarely flooded---	0-2	.15	.20	5	2	134
	2-15	.15	.24			
	15-59	.02	.10			
4275: Pinkcan-----	0-1	.43	.43	4	5	56
	1-11	.20	.20			
	11-19	.24	.24			
	19-25	.32	.32			
	25-28	.20	.20			
	28-33	.15	.32			
	33-47	.20	.32			
	47-60	.32	.32			
Werewolf-----	0-1	.24	.24	5	2	134
	1-15	.24	.24			
	15-31	.10	.24			
	31-41	.10	.24			
	41-54	.05	.15			
	54-65	.17	.17			
Gocougs, warm-----	0-1	.37	.37	3	3	86
	1-8	.37	.37			
	8-34	.10	.20			
	34-39	.15	.37			
4280: Mekkadale-----	0-1	.43	.43	2	5	56
	1-12	.37	.37			
	12-19	.32	.32			
	19-26	.32	.32			
	26-59	.10	.24			
Edalph, warm-----	0-2	.15	.24	5	5	56
	2-15	.10	.20			
	15-20	.20	.20			
	20-31	.17	.17			
	31-59	.10	.15			
4285: Typic Argidurids-----	0-1	.02	.37	2	8	0
	1-2	.43	.43			
	2-7	.20	.43			
	7-18	.15	.43			
	18-23	.10	.43			
	23-33	---	---			



# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
4285:						
Coppermine-----	0-1	.32	.32	1	3	86
	1-8	.10	.28			
	8-11	.05	.24			
	11-20	---	---			
Minhoyt, warm-----	0-1	.49	.49	1	3	86
	1-7	.49	.49			
	7-59	---	---			
4403:						
Arizo, rarely flooded, channeled-----	0-6	.02	.02	5	1	220
	6-59	.02	.02			
Arizo, rarely flooded---	0-6	.02	.02	5	1	220
	6-59	.02	.02			
Arizo-----	0-4	.32	.32	5	3	86
	4-59	.02	.02			
4440:						
Dragonwash, occasionally flooded-----	0-1	.17	.24	5	2	134
	1-5	.10	.10			
	5-59	.02	.02			
Dragonwash, frequently flooded-----	0-1	.10	.10	5	1	220
	1-10	.02	.02			
	10-59	.02	.02			
4450:						
Morongo, occasionally flooded-----	0-6	.10	.10	5	1	220
	6-18	.02	.02			
	18-60	.02	.02			
Morongo, frequently flooded-----	0-2	.10	.10	5	1	220
	2-7	.05	.10			
	7-60	.02	.02			
4605:						
Pinecity, moist-----	0-1	.24	.24	1	2	134
	1-8	.24	.24			
	8-59	---	---			
4606:						
Pinecity-----	0-1	.15	.28	1	2	134
	1-6	.17	.28			
	6-59	---	---			
Rock outcrop.						
4607:						
Pinecity-----	0-2	.20	.20	1	1	220
	2-6	.20	.20			
	6-59	---	---			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
4608:						
Pinecity-----	0-2	.32	.32	1	2	134
	2-5	.32	.32			
	5-59	---	---			
Rock outcrop.						
4610:						
Desertqueen-----	0-2	.28	.28	2	3	86
	2-5	.17	.24			
	5-12	.20	.20			
	12-14	.02	.15			
	14-59	---	---			
Jumborox, warm-----	0-1	.20	.20	5	2	134
	1-3	.20	.20			
	3-17	.10	.15			
	17-28	.10	.15			
	28-53	.10	.20			
	53-71	.05	.05			
Rock outcrop.						
4615:						
Desertqueen, cool-----	0-3	.28	.28	2	3	86
	3-13	.28	.28			
	13-59	---	---			
Jumborox-----	0-1	.10	.10	5	1	220
	1-4	.20	.20			
	4-14	.20	.20			
	14-22	.20	.20			
	22-37	.17	.17			
	37-71	.20	.20			
Rock outcrop.						
4620:						
Stranger-----	0-1	.37	.37	1	2	134
	1-3	.20	.20			
	3-13	---	---			
Rock outcrop.						
Grubstake, moist-----	0-1	.43	.43	1	2	134
	1-15	.32	.32			
	15-18	---	---			
	18-28	---	---			
4625:						
Grinder-----	0-0	.24	.37	1	5	56
	0-3	.20	.37			
	3-8	.15	.24			
	8-18	---	---			
Grinder, cool-----	0-1	.28	.49	1	6	48
	1-3	.20	.37			
	3-8	.15	.24			
	8-18	---	---			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
4625: Pinkcan, cool-----	0-0	.28	.28	4	3	86
	0-11	.20	.20			
	11-19	.24	.24			
	19-25	.32	.32			
	25-28	.20	.20			
	28-33	.15	.32			
	33-47	.20	.32			
	47-60	.32	.32			
4630: Thunderclap-----	0-2	.10	.10	5	1	220
	2-11	.10	.10			
	11-39	.05	.05			
	39-63	.05	.05			
	63-79	---	---			
Smithcanyon-----	0-1	.24	.24	2	2	134
	1-8	.24	.24			
	8-13	.10	.15			
	13-59	---	---			
4804: Rock outcrop.						
Ironped-----	0-2	.17	.28	1	2	134
	2-59	---	---			
Pinecity-----	0-1	.15	.28	1	2	134
	1-6	.17	.28			
	6-59	---	---			
4805: Rock outcrop.						
Ironped, cool-----	0-2	.17	.28	1	2	134
	2-59	---	---			
4806. Rock outcrop						
4811: Rock outcrop.						
Pioneertown-----	0-4	.05	.10	1	1	220
	4-10	.10	.24			
	10-20	---	---			
4825: Rock outcrop.						
Grubstake-----	0-1	.43	.43	1	2	134
	1-15	.32	.32			
	15-18	---	---			
	18-28	---	---			
Cajon, rarely flooded---	0-1	.10	.10	5	1	220
	1-19	.24	.24			
	19-38	.10	.15			
	38-59	.02	.02			
Stranger, warm-----	0-1	.20	.20	1	1	220
	1-9	.20	.20			
	9-19	---	---			

# Soil Survey of Joshua Tree National Park, California

Table 20.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (inches)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
4830: Rock outcrop.						
Pinecity, cool-----	0-1	.15	.28	1	2	134
	1-6	.17	.28			
	6-59	---	---			
4900: Rock outcrop.						
Aguilareal-----	0-3	.02	.20	1	8	0
	3-4	.10	.37			
	4-14	.15	.37			
	14-19	.15	.37			
	19-29	---	---			
Lostpalms-----	0-1	.24	.37	1	2	134
	1-7	.15	.37			
	7-17	---	---			

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon

(This table displays soil organic carbon (SOC) and soil inorganic carbon (SIC) in kilograms per square meter to a depth of 2 meters or to the representative top depth of any kind of bedrock or any cemented soil horizon. SOC and SIC are reported on a volumetric whole soil basis, corrected for representative rock fragments indicated in the database. SOC is converted from horizon soil organic matter of the fraction of the soil less than 2 mm in diameter. If soil organic matter indicated in the database is NULL, SOC is assumed to be zero. SIC is converted from horizon calcium carbonate content fraction of the soil less than 2 mm in diameter. If horizon calcium carbonate indicated in the database is NULL, SIC is assumed to be zero. A weighted average of all horizons is used in the calculations. Only major components of a map unit are displayed in this table)

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
1220:		
Jadestorm (60%)-----	0	0
Blackeagle, cool (20%)-----	0	0
Rock outcrop (10%)-----	0	0
1225:		
Blackeagle (65%)-----	0	0
Rock outcrop (15%)-----	0	0
1230:		
Jadestorm (45%)-----	0	0
Jadestorm, cool (20%)-----	0	0
Rock outcrop (15%)-----	0	0
1240:		
Meccapass (45%)-----	0	1
Bulletproof (20%)-----	0	0
Rock outcrop (10%)-----	0	0
1241:		
Meccapass (45%)-----	0	0
Seanna (20%)-----	1	0
Contactmine, dry (20%)-----	1	0
1242:		
Meccapass (40%)-----	0	0
Jadestorm (25%)-----	0	0
Rock outcrop (15%)-----	0	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	<u>kg/m<sup>2</sup></u>	<u>kg/m<sup>2</sup></u>
1250:		
Ironlung (50%)-----	0	0
Ironlung, cool (20%)-----	0	0
Rock outcrop (15%)-----	0	0
1255:		
Goldenhills (40%)-----	1	0
Bulletproof (15%)-----	0	0
Fanhill (15%)-----	0	0
Whiterobe (15%)-----	1	0
1260:		
Whiterobe (45%)-----	1	0
Bigbernie (20%)-----	0	0
Whiterobe, cool (15%)-----	1	0
1410:		
Missionwell (50%)-----	0	0
Rock outcrop (20%)-----	0	0
Missionwell, high elevation (15%)-----	0	0
1415:		
Bolero (60%)-----	0	0
Rock outcrop (20%)-----	0	0
1504:		
Rizzo, rarely flooded, stony (50%)-----	0	0
Rizzo, occasionally flooded, stony (35%)-----	0	0
1510:		
Carrizo, very gravelly sandy loam (85%)-----	2	1
1511:		
Carrizo, channeled (75%)-----	1	1
Carrizo, occasionally flooded (15%)-----	1	1
1512:		
Carrizo, extremely gravelly sandy loam (80%)-----	1	1
1513:		
Carrizo (60%)-----	1	0
Carrizo, occasionally flooded, channeled (20%)---	2	1
Rubylee (15%)-----	2	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	<u>kg/m<sup>2</sup></u>	<u>kg/m<sup>2</sup></u>
1514:		
Carrizo, rarely flooded (40%)-----	1	2
Pintobasin, fine sandy loam (30%)-----	2	0
Rubylee (15%)-----	2	0
1515:		
Pintobasin (80%)-----	1	0
Carrizo, occasionally flooded (15%)-----	1	1
1516:		
Pintobasin, fine sandy loam (90%)-----	2	0
1517:		
Pintobasin (65%)-----	1	0
Dalelake (25%)-----	2	0
1520:		
Pintobasin, loamy sand (80%)-----	2	0
1522:		
Pintobasin, rarely flooded (85%)-----	1	0
1523:		
Pintobasin, rarely flooded (50%)-----	1	0
Aquapeak (25%)-----	0	21
Pintobasin, occasionally flooded (20%)-----	1	0
1524:		
Pintobasin, rarely flooded (90%)-----	2	0
1525:		
Pintobasin, occasionally flooded (45%)-----	1	0
Pintobasin, rarely flooded (35%)-----	2	0
1526:		
Pintobasin, rarely flooded (55%)-----	2	0
Joetree (20%)-----	2	0
Patscamp (15%)-----	2	15
1527:		
Pintobasin, moist (90%)-----	2	0
1530:		
Dalelake, fine sand (85%)-----	2	0
1531:		
Dalelake (60%)-----	4	0
Pintobasin, rarely flooded (30%)-----	1	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
1540:		
Carrizo, very rarely flooded (35%)-----	2	1
Carrizo, stable (25%)-----	1	0
Carrizo, occasionally flooded, rocky surface (20%)-----	1	2
Russiroks (20%)-----	0	6
1541:		
Carrizo, stable (50%)-----	1	0
Cambidic Haplodurids (40%)-----	0	0
1542:		
Carrizo, very rarely flooded (70%)-----	2	0
Carrizo, occasionally flooded (20%)-----	1	1
1550:		
Buzzardsprings, stable (35%)-----	1	5
Coxpin (25%)-----	0	7
Dalelake (20%)-----	2	0
1555:		
Goldrose (35%)-----	1	0
Carsitas, very rarely flooded (30%)-----	1	0
Chemwash, rarely flooded (25%)-----	1	0
2003:		
Emptygun (100%)-----	1	19
2060:		
Joetree, very rarely flooded (35%)-----	2	0
Dalelake (30%)-----	2	0
Pintobasin, fine sandy loam (25%)-----	2	0
2065:		
Dalelake (30%)-----	2	0
Aquapeak (25%)-----	0	21
Coxpin (25%)-----	0	7
2067:		
Aquapeak, overblown (30%)-----	0	4
Buzzardsprings (25%)-----	1	5
Dalelake, thick sandy surface (20%)-----	4	0
Buzzardsprings, steep (15%)-----	2	4



# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
2068:		
Aquapeak (45%)-----	0	21
Carpetflat, nongravelly surface (35%)-----	0	4
Pintobasin (15%)-----	1	0
2070:		
Missionsweet (60%)-----	0	1
Carpetflat (25%)-----	0	1
2075:		
Oldale (50%)-----	1	0
Missionsweet (30%)-----	0	1
2076:		
Oldale (40%)-----	1	0
Carrizo (30%)-----	2	1
2077:		
Oldale (50%)-----	0	0
Carrizo (25%)-----	1	0
Carrizo, very rarely flooded (15%)-----	2	1
2085:		
Rainbowsend (45%)-----	1	2
Goldenbell (35%)-----	0	0
2090:		
Deprave (35%)-----	1	3
Rockhound (25%)-----	0	0
Rizzo (20%)-----	0	0
2091:		
Deprave (60%)-----	0	4
Roostertail (15%)-----	0	7
2100:		
Perurose (50%)-----	1	7
Coxpin (25%)-----	0	7
Pintobasin, gravelly surface (15%)-----	2	0
2101:		
Perurose, rarely flooded (60%)-----	1	8
Pintobasin, rarely flooded (35%)-----	1	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
2110:		
Descent (80%)-----	1	9
Descent, stable (15%)-----	1	9
2111:		
Descent, warm (45%)-----	1	9
Rubylee, very rarely flooded (40%)-----	2	0
2120:		
Rizzo, rarely flooded (35%)-----	0	0
Deprave (35%)-----	0	3
Rizzo, frequently flooded (20%)-----	0	0
2121:		
Rizzo, rubbly (90%)-----	0	0
2130:		
Goldenbell (55%)-----	0	0
Descent (40%)-----	1	9
2140:		
Rockhound, cobbly (85%)-----	1	0
2402:		
Rizzo (70%)-----	0	0
Rizzo, frequently flooded (20%)-----	0	0
2403:		
Rizzo (80%)-----	0	0
Rizzo, occasionally flooded (15%)-----	0	0
2404:		
Rizzo, occasionally flooded (60%)-----	0	0
Rizzo, very rarely flooded (35%)-----	0	0
2405:		
Carrizo, rarely flooded (65%)-----	1	2
Carrizo, occasionally flooded (25%)-----	1	1
2406:		
Pintobasin, frequently flooded (50%)-----	1	0
Carrizo, occasionally flooded (40%)-----	1	1
2407:		
Pintobasin, rarely flooded (45%)-----	1	0
Carrizo, occasionally flooded (30%)-----	1	1
Carrizo, frequently flooded (20%)-----	1	1

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
2408:		
Rizzo, frequently flooded (55%)-----	0	0
Rizzo, very rarely flooded (35%)-----	0	0
2409:		
Rizzo, frequently flooded (35%)-----	0	0
Chemwash, frequently flooded (30%)-----	2	0
Carsitas, occasionally flooded, braided (25%)----	1	0
2420:		
Carsitas, frequently flooded (45%)-----	1	0
Carsitas, occasionally flooded (40%)-----	1	0
Carsitas, rarely flooded (15%)-----	1	0
2421:		
Carsitas, very rarely flooded (55%)-----	1	0
Carsitas, rarely flooded (25%)-----	1	0
2431:		
Chemwash, frequently flooded, braided (60%)-----	2	0
Chemwash, frequently flooded (25%)-----	2	0
2440:		
Rizzo (35%)-----	0	0
Rizzo, occasionally flooded (30%)-----	0	0
Rizzo, extremely stony (15%)-----	0	0
2715:		
Dalelake (35%)-----	2	0
Sheephole (30%)-----	1	0
Pintobasin (25%)-----	1	0
2716:		
Dalelake (75%)-----	2	0
Dalelake, steep (20%)-----	2	0
2717:		
Dalelake (40%)-----	2	0
Rock outcrop (25%)-----	0	0
Buzzardsprings, fine sand (20%)-----	1	6
2718:		
Dalelake (55%)-----	2	0
Sheephole, gravelly surface (45%)-----	1	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	<u>kg/m<sup>2</sup></u>	<u>kg/m<sup>2</sup></u>
2820:		
Rock outcrop (60%)-----	0	0
Impedimenta (25%)-----	0	0
2825:		
Rock outcrop (35%)-----	0	0
Supplymine (25%)-----	1	12
Bolero, dry (15%)-----	1	0
Ironage (15%)-----	0	3
2830:		
Rock outcrop (80%)-----	0	0
Blackeagle, cool (10%)-----	0	0
2835:		
Rock outcrop (40%)-----	0	0
Blackeagle (40%)-----	0	0
2840:		
Rock outcrop (65%)-----	0	0
Jadestorm (30%)-----	0	0
3110:		
Coppermine, cool (40%)-----	0	0
Stranger (30%)-----	0	0
3120:		
Aguilareal (40%)-----	1	0
Blackeagle (20%)-----	0	0
Rock outcrop (15%)-----	0	0
3213:		
Dalvord (35%)-----	0	0
Aguilareal (30%)-----	1	0
Rock outcrop (25%)-----	0	0
3242:		
Langwell (50%)-----	0	0
Rock outcrop (25%)-----	0	0
Helendale, cool (20%)-----	2	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
3285:		
Pinecity (30%)-----	0	0
Contactmine (20%)-----	1	0
Desertqueen (20%)-----	0	0
Rock outcrop (15%)-----	0	0
3286:		
Pinecity, gravelly loamy sand (85%)-----	0	0
3291:		
Smithcanyon (40%)-----	0	0
Stubbespring (25%)-----	1	0
Rock outcrop (20%)-----	0	0
3292:		
Smithcanyon (35%)-----	1	0
Pinecity (25%)-----	0	0
Rock outcrop (25%)-----	0	0
3293:		
Smithcanyon (50%)-----	0	0
Pinecity (25%)-----	0	0
3294:		
Smithcanyon, dry (80%)-----	1	0
3295:		
Desertqueen, dry (40%)-----	0	0
Hexie (20%)-----	1	1
Rock outcrop (20%)-----	0	0
3296:		
Desertqueen (45%)-----	0	0
Pinecity (35%)-----	0	0
3297:		
Desertqueen, warm (40%)-----	0	0
Contactmine, dry (20%)-----	1	0
Seanna, dry (20%)-----	1	0
3325:		
Ironped, warm (30%)-----	0	0
Rock outcrop (20%)-----	0	0
Hexie (15%)-----	1	1
Ironped (15%)-----	0	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	<u>kg/m<sup>2</sup></u>	<u>kg/m<sup>2</sup></u>
3335:		
Xeric Torriorthents (40%)-----	3	0
Rock outcrop (25%)-----	0	0
Xeric Torriorthents, warm (25%)-----	3	0
3336:		
Xeric Torriorthents (45%)-----	3	0
Bigbernie (25%)-----	0	0
3340:		
Seanna (35%)-----	0	1
Grubstake, moist (20%)-----	0	0
Pinecity (15%)-----	1	0
3345:		
Bigcanyon (55%)-----	1	0
Bigcanyon, cool (20%)-----	1	0
3440:		
Pacific Mesa, steep (65%)-----	0	0
Pacific Mesa (30%)-----	0	0
3509:		
Cajon, very rarely flooded (60%)-----	1	2
Friedliver (20%)-----	1	3
3525:		
Cajon (70%)-----	1	0
Friedliver (15%)-----	1	1
3526:		
Cajon (40%)-----	1	1
Hypoint (35%)-----	1	0
Arizo, occasionally flooded (15%)-----	1	0
3611:		
Burntshack, sand surface (50%)-----	2	0
Burntshack (35%)-----	2	0
3612:		
Burntshack (75%)-----	2	0
Burntshack, occasionally flooded (20%)-----	1	0
3676:		
Morongo, loamy sand, very rarely flooded (80%)---	2	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
3677: Morongo (80%)-----	3	0
3679: Morongo, cool (55%)-----	2	0
Jumborox (20%)-----	2	0
3680: Morongo (85%)-----	2	0
3681: Morongo, very rarely flooded (45%)-----	2	0
Jumborox, dry (35%)-----	2	0
3682: Morongo, cool (50%)-----	2	0
Jumborox (15%)-----	2	0
Urban land (15%)-----	0	0
3683: Morongo (55%)-----	1	0
Bluecut, very rarely flooded (30%)-----	1	2
3684: Morongo, warm (85%)-----	2	0
3685: Morongo, cool (65%)-----	2	0
Desertqueen, undulating (15%)-----	0	0
3690: Nasagold (85%)-----	1	0
3695: Gocougs (80%)-----	1	14
4031: Crosgrain (50%)-----	1	1
Crackerjack (30%)-----	0	8
Pinkcan, dry (15%)-----	1	0
4041: Silvermine (40%)-----	0	16
Helendale (30%)-----	2	0
Burntshack, very rarely flooded (20%)-----	2	0
4064: Gravesumit (55%)-----	1	6
Helendale, sandy surface (35%)-----	2	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
4071:		
Helendale (65%)-----	2	0
Desertqueen, very rarely flooded (15%)-----	0	0
4091:		
Littlefargo (85%)-----	1	0
Rock outcrop (10%)-----	0	0
4245:		
Bluecut (40%)-----	2	0
Morongo, very rarely flooded (25%)-----	2	0
Yander, very rarely flooded (15%)-----	1	0
4260:		
Minhoyt (45%)-----	0	9
Corbilt, rarely flooded (40%)-----	1	27
4265:		
Werewolf, warm (80%)-----	1	0
4270:		
Yuccabutte (95%)-----	1	0
4271:		
Yuccabutte, warm (60%)-----	1	0
Arizo, rarely flooded (30%)-----	1	0
4275:		
Pinkcan (35%)-----	1	0
Werewolf (25%)-----	1	0
Gocougs, warm (15%)-----	1	1
4280:		
Mekkadale (55%)-----	0	8
Edalph, warm (25%)-----	1	19
4285:		
Typic Argidurids (35%)-----	0	0
Coppermine (30%)-----	0	0
Minhoyt, warm (25%)-----	0	4
4403:		
Arizo, rarely flooded, channeled (50%)-----	1	0
Arizo, rarely flooded (25%)-----	1	0
Arizo (20%)-----	2	0



# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m <sup>2</sup>	kg/m <sup>2</sup>
4440:		
Dragonwash, occasionally flooded (55%)-----	2	2
Dragonwash, frequently flooded (35%)-----	1	1
4450:		
Morongo, occasionally flooded (75%)-----	2	0
Morongo, frequently flooded (15%)-----	2	0
4605:		
Pinecity, moist (80%)-----	0	0
4606:		
Pinecity (60%)-----	0	0
Rock outcrop (25%)-----	0	0
4607:		
Pinecity (85%)-----	0	0
4608:		
Pinecity (60%)-----	0	0
Rock outcrop (30%)-----	0	0
4610:		
Desertqueen (35%)-----	0	0
Jumborox, warm (25%)-----	2	0
Rock outcrop (20%)-----	0	0
4615:		
Desertqueen, cool (45%)-----	0	0
Jumborox (25%)-----	2	0
Rock outcrop (15%)-----	0	0
4620:		
Stranger (40%)-----	0	0
Rock outcrop (35%)-----	0	0
Grubstake, moist (20%)-----	0	0
4625:		
Grinder (50%)-----	0	0
Grinder, cool (20%)-----	0	0
Pinkcan, cool (15%)-----	1	0
4630:		
Thunderclap (50%)-----	2	0
Smithcanyon (30%)-----	2	0

# Soil Survey of Joshua Tree National Park, California

Table 21.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	<u>kg/m<sup>2</sup></u>	<u>kg/m<sup>2</sup></u>
4804:		
Rock outcrop (45%)-----	0	0
Ironped (25%)-----	0	0
Pinecity (20%)-----	0	0
4805:		
Rock outcrop (50%)-----	0	0
Ironped, cool (30%)-----	0	0
4806:		
Rock outcrop (90%)-----	0	0
4811:		
Rock outcrop (85%)-----	0	0
Pioneertown (10%)-----	1	0
4825:		
Rock outcrop (30%)-----	0	0
Grubstake (20%)-----	0	0
Cajon, rarely flooded (20%)-----	1	2
Stranger, warm (15%)-----	0	0
4830:		
Rock outcrop (80%)-----	0	0
Pinecity, cool (10%)-----	0	0
4900:		
Rock outcrop (65%)-----	0	0
Aguilareal (15%)-----	0	0
Lostpalms (15%)-----	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
1220:						
Jadestorm-----	0-2	3.3-10.2	6.6-8.0	0-1	0	0
	2-3	3.3-10.2	6.6-8.0	0-1	0	0
	3-10	4.8-12.9	7.8-8.2	0-1	0	0
	10-17	---	---	---	---	---
	17-26	---	---	---	---	---
Blackeagle, cool-----	0-2	3.3-7.9	6.2-7.6	0	0	0
	2-3	3.3-7.9	6.2-7.6	0-1	0	0
	3-11	6.2-7.7	7.0-8.0	0-1	0	0
	11-18	6.2-13.6	7.0-8.0	1-3	0	0
	18-30	---	---	---	---	---
1225:						
Blackeagle-----	0-3	4.8-10.2	6.2-7.6	0	0	0
	3-4	4.8-10.2	6.2-7.6	0-1	0	0
	4-14	6.2-13.6	7.0-8.0	1-3	0	0
	14-24	---	---	---	---	---
1230:						
Jadestorm-----	0-3	4.8-10.2	6.6-8.0	0-1	0	0
	3-7	4.8-10.2	6.6-8.0	0-1	0	0
	7-11	4.8-12.9	7.8-8.2	0-1	0	0
	11-20	---	---	---	---	---
	20-30	---	---	---	---	---
Jadestorm, cool-----	0-2	4.8-10.2	6.6-8.0	0-1	0	0
	2-3	4.8-10.2	6.6-8.0	0-1	0	0
	3-10	4.8-12.9	7.8-8.2	0-1	0	0
	10-17	---	---	---	---	---
	17-26	---	---	---	---	---
1240:						
Meccapass-----	0-1	4.8-8.6	7.4-7.8	0	0	0
	1-2	4.8-8.6	7.4-7.8	0	0	0
	2-16	4.8-13.6	7.6-8.2	0-3	0	0
	16-37	4.8-10.7	7.6-8.2	0-3	0	0
	37-59	---	---	---	---	---
Bulletproof-----	0-3	0.8-3.1	6.6-8.4	0-1	0	0
	3-6	0.8-6.4	6.6-8.4	0-1	0.0-2.0	0-4
	6-11	2.5-6.1	6.6-8.4	0-1	0.0-2.0	0-4
	11-59	---	---	---	---	---
1241:						
Meccapass-----	0-1	4.8-10.2	7.4-7.8	0	0	0
	1-2	4.8-10.2	7.4-7.8	0	0	0
	2-16	4.8-13.6	7.6-8.2	0-3	0	0
	16-27	4.8-10.7	7.6-8.2	0-3	0	0
	27-59	---	---	---	---	---
Seanna-----	0-1	6.2-14.7	7.4-7.8	0-1	0.0-2.0	0-4
	1-12	6.2-14.7	7.4-7.8	0-1	0.0-2.0	0-4
	12-59	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
1241:						
Contactmine, dry-----	0-2	4.8-14.7	6.6-7.8	0	0	0-4
	2-6	5.5-14.3	6.6-7.8	0	0	0-4
	6-11	12.2-22.7	7.4-7.8	0	0	0-4
	11-25	12.9-21.3	7.4-8.4	0-1	0	0-4
	25-59	---	---	---	---	---
1242:						
Meccapass-----	0-1	4.8-8.6	7.4-7.8	0	0	0
	1-2	4.8-8.6	7.4-7.8	0	0	0
	2-16	4.8-13.6	7.6-8.2	0-3	0	0
	16-27	4.8-10.7	7.6-8.2	0-3	0	0
	27-59	---	---	---	---	---
Jadestorm-----	0-2	4.8-10.2	6.6-8.0	0-1	0	0
	2-3	4.8-10.2	6.6-8.0	0-1	0	0
	3-8	4.8-12.9	7.8-8.2	0-1	0	0
	8-20	---	---	---	---	---
	20-30	---	---	---	---	---
1250:						
Ironlung-----	0-2	0.8-4.0	6.6-8.4	0-1	0.0-2.0	0-4
	2-6	0.8-3.8	6.6-8.4	0-1	0.0-2.0	0-4
	6-59	---	---	---	---	---
Ironlung, cool-----	0-1	0.8-4.0	6.6-8.4	0-1	0.0-2.0	0-4
	1-4	0.8-3.8	6.6-8.4	0-1	0.0-2.0	0-4
	4-59	---	---	---	---	---
1255:						
Goldenhills-----	0-2	2.0-4.7	7.4-8.4	0-1	0.0-2.0	0-4
	2-3	2.0-6.1	7.4-8.4	0-1	0.0-2.0	0-4
	3-10	2.0-7.0	7.4-9.0	0-1	0.0-2.0	0-4
	10-26	0.8-7.0	7.9-9.0	0-1	0.0-2.0	0-4
	26-47	0.8-7.0	7.9-9.0	0-1	0.0-2.0	0-4
	47-57	---	---	---	---	---
Bulletproof-----	0-2	0.8-3.1	6.6-8.4	0-1	0	0
	2-3	0.8-4.0	6.6-8.4	0-1	0.0-2.0	0-4
	3-5	0.8-7.0	6.6-8.4	0-1	0.0-2.0	0-4
	5-14	0.8-7.0	6.6-9.0	0-1	0.0-2.0	0-4
	14-59	---	---	---	---	---
Fanhill-----	0-5	4.8-7.1	7.4-7.6	0	0.0-2.0	0-4
	5-6	4.8-7.1	7.4-7.6	0	0.0-2.0	0-4
	6-15	4.8-9.9	7.9-8.2	0-1	0.0-2.0	0-4
	15-18	4.8-9.9	7.9-8.2	0-1	0.0-2.0	0-4
	18-59	---	---	0-1	---	---
Whiterobe-----	0-1	0.8-2.5	6.6-8.4	0-1	0.0-2.0	0-4
	1-2	0.8-3.1	6.6-8.4	0-1	0.0-2.0	0-4
	2-12	0.8-4.5	7.4-9.0	0-1	0.0-2.0	0-4
	12-26	0.8-4.5	7.4-9.0	0-1	0.0-2.0	0-4
	26-59	---	---	---	---	---
1260:						
Whiterobe-----	0-1	0.8-3.1	6.6-8.4	0-1	0.0-2.0	0-4
	1-11	0.8-4.5	7.4-9.0	0-1	0.0-2.0	0-4
	11-24	0.8-4.5	7.4-9.0	0-1	0.0-2.0	0-4
	24-59	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
1260:						
Bigbernie-----	0-1	1.4-4.0	6.6-8.4	0-1	0.0-2.0	0-4
	1-4	1.4-3.8	7.4-8.4	0-1	0.0-2.0	0-4
	4-24	0.8-3.1	7.4-8.4	0-1	0.0-2.0	0-4
	24-59	---	---	---	---	---
Whiterobe, cool-----	0-1	0.8-3.1	6.6-8.4	0-1	0.0-2.0	0-4
	1-11	0.8-4.5	7.4-9.0	0-1	0.0-2.0	0-4
	11-24	0.8-4.5	7.4-9.0	0-1	0.0-2.0	0-4
	24-59	---	---	---	---	---
1410:						
Missionwell-----	0-2	4.8-7.1	6.6-8.4	0-1	0	0
	2-3	4.8-7.1	6.6-8.4	0-1	0	0
	3-8	6.2-12.5	6.6-8.4	0-5	0	0
	8-18	---	---	---	---	---
Missionwell, high elevation-----	0-2	4.8-10.2	6.6-8.4	0-1	0	0
	2-3	4.8-10.2	6.6-8.4	0-1	0	0
	3-8	6.2-12.5	6.6-8.4	0-5	0	0
	8-18	---	---	---	---	---
1415:						
Bolero-----	0-6	1.4-4.7	7.4-8.4	0	0	0
	6-7	1.4-4.7	7.4-8.4	0	0	0
	7-12	2.5-7.0	7.4-8.4	0	0	0
	12-15	2.5-7.0	7.4-8.4	0	0	0
	15-19	2.5-7.0	7.4-8.4	0	0	0
	19-29	---	---	---	---	---
1504:						
Rizzo, rarely flooded, stony-----	0-1	0.8-4.0	7.4-8.4	0	0	0
	1-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
Rizzo, occasionally flooded, stony-----	0-2	1.4-4.7	7.4-8.4	0	0	0
	2-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
1510:						
Carrizo, very gravelly sandy loam-	0-1	1.4-7.4	6.4-8.0	1-5	0	0
	1-5	1.4-7.4	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
1511:						
Carrizo, channeled---	0-1	1.4-6.1	6.4-8.0	0-3	0	0
	1-5	1.4-6.1	6.8-8.2	0-1	0	0
	5-13	1.4-4.7	7.0-8.4	1-3	0	0
	13-59	1.4-4.7	7.0-8.4	0-3	0	0
Carrizo, occasionally flooded	0-1	1.4-6.1	6.4-8.0	1-5	0	0
	1-5	1.4-6.1	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
1512: Carrizo, extremely gravelly sandy loam	0-1	2.5-7.4	6.4-8.0	0-1	0	0
	1-4	1.4-5.7	6.8-8.2	1-3	0	0
	4-59	1.4-4.5	7.0-8.4	1-3	0	0
1513: Carrizo-----	0-1	3.1-7.4	7.4-8.8	0-1	0	0
	1-5	1.4-6.1	6.8-8.2	1-3	0	0
	5-13	1.4-4.7	7.0-8.4	1-3	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
Carrizo, occasionally flooded, channeled--	0-1	1.4-6.1	7.2-8.0	0-1	0	0
	1-5	1.4-7.4	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
Rubylee-----	0-2	6.2-12.5	6.6-8.4	0-5	0	0
	2-5	7.6-14.3	7.4-8.4	0-1	0	0
	5-18	7.6-14.3	7.4-8.4	0-1	0	0
	18-59	2.6-12.9	7.4-9.0	0-1	0	0
1514: Carrizo, rarely flooded-----	0-1	3.1-7.4	7.4-8.8	0-1	0	0
	1-5	1.4-6.1	6.8-8.2	1-3	0	0
	5-59	1.4-4.7	7.0-8.4	1-3	0	0
Pintobasin, fine sandy loam-----	0-2	3.1-7.4	6.0-7.8	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
Rubylee-----	0-2	6.2-12.5	6.6-8.4	0-5	0	0
	2-5	7.6-14.3	7.4-8.4	0-1	0	0
	5-18	7.6-14.3	7.4-8.4	0-1	0	0
	18-59	2.6-12.9	7.4-9.0	0-1	0	0
1515: Pintobasin-----	0-2	1.4-6.1	6.0-7.0	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
Carrizo, occasionally flooded	0-1	1.4-6.1	6.4-8.0	1-5	0	0
	1-5	1.4-6.1	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
1516: Pintobasin, fine sandy loam-----	0-2	3.1-7.4	6.0-7.8	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
1517:						
Pintobasin-----	0-1	1.4-4.7	6.0-7.0	0	0	0
	1-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
Dalelake-----	0-4	0.8-2.6	6.6-7.8	0	0	0
	4-59	0.8-2.4	6.6-8.4	0	0	0
1520:						
Pintobasin, loamy sand-----	0-2	1.4-7.4	6.1-7.8	0	0.0-2.0	0-4
	2-14	1.4-4.5	7.8-8.4	0	0.0-2.0	0-4
	14-35	0.8-4.5	6.1-8.4	0	0.0-2.0	0-4
	35-59	0.8-4.5	6.1-8.4	0	0.0-2.0	0-4
1522:						
Pintobasin, rarely flooded-----	0-2	1.4-7.4	6.0-7.0	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
1523:						
Pintobasin, rarely flooded-----	0-2	1.4-7.4	6.0-7.0	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
Aquapeak-----	0-0	2.6-5.5	7.4-9.4	0-5	0	0-4
	0-11	6.2-12.9	7.4-9.0	0-10	0.0-4.0	0
	11-19	2.6-8.4	7.4-9.0	1-20	0.0-4.0	0
	19-33	2.6-8.4	7.4-9.0	1-20	0.0-4.0	0
	33-59	1.9-8.4	7.4-9.0	1-15	0.0-4.0	0
Pintobasin, occasionally flooded	0-2	1.4-7.4	6.0-7.0	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
1524:						
Pintobasin, rarely flooded-----	0-2	1.4-6.1	6.0-7.0	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
1525:						
Pintobasin, occasionally flooded	0-2	1.4-7.4	6.0-7.0	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
Pintobasin, rarely flooded-----	0-2	1.4-7.4	6.1-7.8	0	0.0-2.0	0-4
	2-14	1.4-4.5	7.8-8.4	0	0.0-2.0	0-4
	14-35	0.8-4.5	6.1-8.4	0	0.0-2.0	0-4
	35-59	0.8-4.5	6.1-8.4	0	0.0-2.0	0-4

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
1526:						
Pintobasin, rarely flooded-----	0-3	1.4-6.1	6.0-7.0	0	0	0
	3-7	1.4-4.5	6.2-7.4	0	0	0
	7-20	0.8-4.5	6.0-7.8	0	0	0
	20-59	0.8-4.5	6.5-8.0	0	0	0
Joetree-----	0-2	0.8-4.7	6.6-7.8	0	0	0
	2-43	0.8-4.5	7.4-8.4	0	0	0
	43-65	8.5-17.2	7.4-8.8	0-7	0	0
	65-71	2.5-5.7	7.4-8.4	0-5	0	0
Patscamp-----	0-1	1.8-5.5	7.4-8.4	0-1	0.0-2.0	0-4
	1-10	1.0-5.3	7.4-9.0	0-1	0.0-2.0	0-4
	10-17	14.2-18.7	7.4-8.8	0-5	0.0-2.0	0-4
	17-35	14.2-17.8	7.4-8.8	1-20	0.0-2.0	0-4
	35-45	12.9-12.9	7.4-8.8	1-20	0.0-2.0	0-4
	45-53	6.2-11.4	7.4-8.8	5-25	0.0-2.0	0-4
	53-63	6.2-11.4	7.4-8.8	5-15	0.0-2.0	0-4
1527:						
Pintobasin, moist----	0-2	1.4-7.4	6.1-7.8	0	0.0-2.0	0-4
	2-14	1.4-4.5	7.8-8.4	0	0.0-2.0	0-4
	14-35	0.8-4.5	6.1-8.4	0	0.0-2.0	0-4
	35-59	0.8-4.5	6.1-8.4	0	0.0-2.0	0-4
1530:						
Dalelake, fine sand--	0-4	0.8-2.6	6.6-7.8	0	0	0
	4-59	0.8-2.4	6.6-8.4	0	0	0
1531:						
Dalelake-----	0-2	0.8-3.3	6.0-7.0	0-1	0	0
	2-13	0.8-3.3	6.4-8.2	0-1	0	0
	13-22	0.8-3.3	7.6-8.2	0-1	0	0
	22-59	0.8-3.3	7.6-8.2	0-1	0	0
Pintobasin, rarely flooded-----	0-2	1.4-7.4	6.0-7.0	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
1540:						
Carrizo, very rarely flooded-----	0-1	1.4-7.4	6.4-8.0	1-5	0	0
	1-5	1.4-7.4	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
Carrizo, stable-----	0-1	3.1-7.4	7.4-8.8	0-1	0	0
	1-5	1.4-6.1	6.8-8.2	1-3	0	0
	5-13	1.4-4.7	7.0-8.4	1-3	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
Carrizo, occasionally flooded, rocky surface-----	0-1	3.1-7.4	7.4-8.8	0-1	0	0
	1-5	1.4-6.1	6.8-8.2	1-3	0	0
	5-59	1.4-4.7	7.0-8.4	1-3	0	0



# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
1540:						
Russiroks-----	0-1	8.9-14.3	7.9-9.0	0-1	0	0
	1-2	8.9-13.6	7.9-9.0	0-5	0.0-4.0	0-4
	2-7	8.9-12.1	7.4-9.0	5-15	0.0-4.0	0-4
	7-30	4.8-8.4	7.9-9.0	5-15	0.0-4.0	0-4
	30-59	4.8-8.4	7.9-9.0	0-7	0.0-4.0	0-4
1541:						
Carrizo, stable-----	0-1	3.1-7.4	7.4-8.8	0-1	0	0
	1-5	1.4-6.1	6.8-8.2	1-3	0	0
	5-13	1.4-4.7	7.0-8.4	1-3	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
Cambidic Haplodurids-	0-2	5.8-9.4	7.4-8.4	0	0	0
	2-2	5.8-9.4	7.4-8.4	0	0	0
	2-5	4.6-7.9	6.6-8.4	0	0	0
	5-16	1.0-5.1	6.6-8.4	0	0	0
	16-20	1.0-4.6	6.6-8.4	0	0	0
	20-59	1.0-5.1	6.6-8.4	0	0	0
1542:						
Carrizo, very rarely flooded-----	0-1	1.4-7.4	6.4-8.0	1-5	0	0
	1-5	1.4-7.4	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
Carrizo, occasionally flooded	0-1	1.4-6.1	6.4-8.0	1-5	0	0
	1-5	1.4-6.1	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
1550:						
Buzzardsprings, stable-----	0-3	4.0-6.7	6.6-8.4	0	0	0
	3-25	1.0-6.5	7.4-8.4	0-10	0	0
	25-59	1.0-5.1	7.4-8.4	0-5	0	0
Coxpin-----	0-1	1.9-6.0	7.4-9.0	0-5	0	0
	1-10	4.6-9.1	7.9-9.0	0-5	0	0
	10-17	1.9-5.1	7.9-9.4	0-15	0.0-1.5	0-2
	17-22	1.0-3.3	7.9-9.0	1-15	0	0
	22-59	1.0-4.0	7.9-9.0	0-5	0	0
Dalelake-----	0-4	0.8-2.6	6.6-7.8	0	0	0
	4-59	0.8-2.4	6.6-8.4	0	0	0
1555:						
Goldrose-----	0-1	2.5-4.7	6.6-7.8	0	0	0
	1-6	1.4-4.5	7.4-8.4	0	0	0
	6-21	0.8-3.1	7.4-8.4	0	0	0
	21-31	0.8-3.1	7.4-8.4	0	0	0
	31-59	0.8-3.1	7.4-8.4	0	0	0
Carsitas, very rarely flooded-----	0-1	1.4-4.0	6.6-8.4	0	0	0
	1-59	0.8-3.1	7.4-8.4	0-1	0	0
Chemwash, rarely flooded-----	0-2	0.8-4.7	7.4-8.4	0-1	0	0
	2-67	0.8-4.5	7.4-8.4	0-1	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2003:						
Emptygun-----	0-2	3.3-9.4	7.9-8.4	0-10	0.0-2.0	0
	2-10	5.2-8.0	7.9-8.4	5-10	0.0-2.0	0
	10-20	4.6-9.1	7.9-8.4	5-15	0.0-2.0	0-5
	20-60	1.9-5.1	7.9-8.4	5-15	0.0-2.0	0-5
2060:						
Joetree, very rarely flooded-----	0-2	0.8-4.7	6.6-7.8	0	0	0
	2-39	0.8-4.5	7.4-8.4	0	0	0
	39-59	8.5-17.2	7.4-8.8	0-7	0	0
	59-71	2.5-5.7	7.4-8.4	0-5	0	0
Dalelake-----	0-4	0.8-2.6	6.6-7.8	0	0	0
	4-59	0.8-2.4	6.6-8.4	0	0	0
Pintobasin, fine sandy loam-----	0-2	3.1-7.4	6.0-7.8	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
2065:						
Dalelake-----	0-4	0.8-2.6	6.6-7.8	0	0	0
	4-59	0.8-2.4	6.6-8.4	0	0	0
Aquapeak-----	0-2	6.2-12.5	7.4-9.4	0-5	0.0-4.0	0
	2-3	6.2-12.5	7.4-9.4	0-5	0.0-4.0	0
	3-11	6.2-12.9	7.4-9.0	0-10	0.0-4.0	0
	11-19	2.6-8.4	7.4-9.0	1-20	0.0-4.0	0
	19-33	2.6-8.4	7.4-9.0	1-20	0.0-4.0	0
	33-59	1.9-8.4	7.4-9.0	1-15	0.0-4.0	0
Coxpin-----	0-1	1.9-4.6	7.4-9.0	0-5	0	0
	1-10	4.6-9.1	7.9-9.0	0-5	0	0
	10-17	1.9-5.1	7.9-9.4	0-15	0.0-1.5	0-2
	17-22	1.0-3.3	7.9-9.0	1-15	0	0
	22-59	1.0-4.0	7.9-9.0	0-5	0	0
2067:						
Aquapeak, overblown--	0-4	6.2-12.5	6.4-7.6	0-1	0	0
	4-9	7.6-15.0	6.8-7.8	1-10	0	0
	9-13	7.6-15.0	8.0-8.4	1-10	0	0
	13-19	5.5-11.1	8.0-8.4	1-20	0	0
	19-43	2.6-7.7	8.0-8.4	0-1	0	0
	43-47	6.2-11.4	8.4-8.8	1-10	0	0
	47-59	2.6-6.9	7.4-8.6	0-1	0	0
Buzzardsprings-----	0-1	1.0-5.3	7.0-8.2	0	0	0
	1-3	1.0-7.9	7.4-8.4	0-5	0	0
	3-8	1.0-7.9	7.4-8.2	0-5	0	0
	8-23	1.0-5.1	8.0-8.6	5-10	0	0
	23-60	1.0-5.1	7.4-8.4	0-5	0	0
Dalelake, thick sandy surface-----	0-2	0.8-3.3	6.0-7.0	0-1	0	0
	2-13	0.8-3.3	6.4-8.2	0-1	0	0
	13-22	0.8-3.3	7.6-8.2	0-1	0	0
	22-59	0.8-3.3	7.6-8.2	0-1	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2067:						
Buzzardsprings, steep	0-1	4.0-6.7	7.0-8.2	0	0	0
	1-3	1.0-7.9	7.4-8.4	0-5	0	0
	3-8	1.0-7.9	7.4-8.2	0-5	0	0
	8-23	1.0-5.1	8.0-8.6	5-10	0	0
	23-60	1.0-5.1	7.4-8.4	0-5	0	0
2068:						
Aquapeak-----	0-0	2.6-5.5	7.4-9.4	0-5	0	0-4
	0-11	6.2-12.9	7.4-9.0	0-10	0.0-4.0	0
	11-19	2.6-8.4	7.4-9.0	1-20	0.0-4.0	0
	19-33	2.6-8.4	7.4-9.0	1-20	0.0-4.0	0
	33-59	1.9-8.4	7.4-9.0	1-15	0.0-4.0	0
Carpetflat, nongravelly surface-	0-0	1.0-3.8	7.9-8.8	0-1	0	0
	0-4	6.2-9.2	8.0-8.4	0-10	0	0
	4-15	1.0-5.3	8.0-8.4	5-10	0	0
	15-61	1.0-2.9	7.4-9.0	0-5	0.0-2.0	0-4
Pintobasin-----	0-1	1.4-4.7	6.0-7.0	0	0	0
	1-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
2070:						
Missionsweet-----	0-2	6.2-11.7	7.8-8.4	0-5	0	0
	2-3	6.2-11.7	7.8-8.4	0-5	0	0
	3-11	6.2-9.6	7.9-8.4	5-10	0	0
	11-17	6.2-9.2	8.0-8.4	5-10	0	0
	17-27	---	---	---	---	---
Carpetflat-----	0-2	7.6-16.2	7.9-8.8	0-5	0	0
	2-4	11.6-16.2	7.9-8.8	0-5	0	0
	4-7	6.2-9.9	8.0-8.4	0-10	0	0
	7-13	6.2-9.2	8.0-8.4	0-10	0	0
	13-16	1.0-5.3	8.0-8.4	5-10	0	0
	16-26	---	---	---	---	---
2075:						
Oldale-----	0-2	10.9-16.2	6.2-8.4	0-5	0	0
	2-3	10.9-16.2	6.2-8.4	0-5	0	0
	3-6	10.9-15.7	6.2-8.4	0-5	0	0
	6-15	11.6-19.2	6.2-7.8	0-1	0	0
	15-27	7.6-14.3	6.1-7.3	0-1	0	0
	27-59	1.8-6.9	6.0-7.6	0-1	0	0
Missionsweet-----	0-2	6.2-11.7	7.8-8.4	0-5	0	0
	2-3	6.2-11.7	7.8-8.4	0-5	0	0
	3-11	6.2-9.6	7.9-8.4	5-10	0	0
	11-17	6.2-9.2	8.0-8.4	5-10	0	0
	17-27	---	---	---	---	---
2076:						
Oldale-----	0-2	10.9-16.2	6.2-8.2	0-5	0	0
	2-4	10.9-16.2	6.2-8.2	0-5	0	0
	4-7	10.9-15.7	6.2-8.4	0-5	0	0
	7-16	11.6-19.2	6.2-7.8	0-1	0	0
	16-28	7.6-14.3	6.1-7.3	0-1	0	0
	28-59	1.8-6.9	6.0-7.6	0-1	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2076:						
Carrizo-----	0-1	1.4-7.4	6.4-8.0	1-5	0	0
	1-5	1.4-7.4	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
2077:						
Oldale-----	0-2	10.9-16.2	6.2-8.4	0-5	0	0
	2-3	10.9-16.2	6.2-8.4	0-5	0	0
	3-6	10.9-15.7	6.2-8.4	0-5	0	0
	6-9	11.6-19.2	6.2-7.8	0-1	0	0
	9-16	7.6-14.3	6.1-7.3	0-1	0	0
	16-59	1.8-6.9	6.0-7.6	0-1	0	0
Carrizo-----	0-1	3.1-7.4	7.4-8.8	0-1	0	0
	1-5	1.4-6.1	6.8-8.2	1-3	0	0
	5-13	1.4-4.7	7.0-8.4	1-3	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
Carrizo, very rarely flooded-----	0-1	1.4-7.4	6.4-8.0	1-5	0	0
	1-5	1.4-7.4	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
2085:						
Rainbowsend-----	0-6	3.3-7.1	6.4-8.4	0-1	0	0
	6-7	3.3-7.1	6.4-8.4	0-1	0	0
	7-15	4.8-9.4	6.8-8.8	1-15	0	0
	15-18	6.2-9.4	6.8-8.8	1-15	0	0
	18-28	---	---	---	---	---
Goldenbell-----	0-2	7.6-13.2	6.6-8.4	0-1	0	0
	2-3	7.6-13.2	6.6-8.4	0-1	0	0
	3-11	10.9-15.7	7.4-8.4	0-1	0	0
	11-16	1.0-2.6	6.6-7.8	0-5	0	0
	16-59	1.0-2.6	6.6-7.8	0-1	0	0
2090:						
Deprave-----	0-2	8.9-14.0	7.4-8.4	0-5	0	0
	2-4	8.9-13.2	7.4-8.4	0-5	0	0
	4-15	10.9-19.9	7.4-8.4	0-10	0	0
	15-39	1.0-3.7	6.6-8.4	0-15	0	0
	39-63	1.0-2.0	6.6-8.4	0-15	0	0
Rockhound-----	0-2	6.2-13.2	7.4-8.4	0	0	0
	2-4	6.2-13.2	7.4-8.4	0-5	0	0
	4-7	10.9-15.0	7.4-8.4	0-10	0	0
	7-17	12.9-19.4	7.4-7.8	0-5	0	0
	17-34	12.9-19.2	7.4-7.8	0-5	0	0
	34-59	1.8-13.5	7.4-8.4	0-10	0	0
Rizzo-----	0-1	3.1-9.4	7.4-8.4	0	0	0
	1-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2091:						
Deprave-----	0-1	8.9-14.0	7.4-8.4	0-5	0	0
	1-2	8.9-13.2	7.4-8.4	0-5	0	0
	2-13	10.9-19.9	7.4-8.4	0-10	0	0
	13-24	1.0-3.7	6.6-8.4	0-15	0	0
	24-63	1.0-2.0	6.6-8.4	0-15	0	0
Roostertail-----	0-1	4.1-11.0	7.4-8.4	5-10	0	0
	1-2	4.1-11.0	7.4-8.4	5-10	0	0
	2-4	6.2-12.9	6.6-8.4	5-10	0	0
	4-29	6.2-12.9	6.6-8.4	5-10	0	0
	29-56	1.0-4.1	7.4-8.4	0-5	0	0
	56-60	---	---	5-35	---	---
	60-69	1.0-4.1	7.4-8.4	0-35	0	0
2100:						
Perurose-----	0-2	3.3-5.3	7.4-9.0	0-1	0.0-2.0	0
	2-3	3.3-3.8	7.4-9.0	0-10	0.0-2.0	0-4
	3-7	1.0-7.2	7.4-9.0	0-15	0.0-2.0	0-4
	7-18	1.0-7.2	7.4-9.0	0-15	0.0-2.0	0-4
	18-30	1.0-2.9	7.4-9.0	0-15	0.0-2.0	0-4
	30-43	1.0-2.9	6.6-8.4	0-10	0.0-2.0	0-4
	43-61	1.0-2.9	7.4-9.0	0-5	0.0-2.0	0-4
Coxpin-----	0-2	4.6-8.8	7.4-9.0	0-5	0	0
	2-10	3.3-9.1	7.9-9.0	0-5	0	0
	10-17	1.9-5.1	7.9-9.4	0-15	0.0-1.5	0-2
	17-22	1.0-3.3	7.9-9.0	1-15	0	0
	22-59	1.0-5.2	7.9-9.0	0-5	0	0
Pintobasin, gravelly surface-----	0-2	1.4-7.4	6.1-7.8	0	0.0-2.0	0-4
	2-14	1.4-4.5	7.8-8.4	0	0.0-2.0	0-4
	14-35	0.8-4.5	6.1-8.4	0	0.0-2.0	0-4
	35-59	0.8-4.5	6.1-8.4	0	0.0-2.0	0-4
2101:						
Perurose, rarely flooded-----	0-1	3.3-3.8	7.4-9.0	0-10	0.0-2.0	0-5
	1-5	1.0-7.2	7.4-9.0	0-15	0.0-2.0	0-5
	5-16	1.0-7.2	7.4-9.0	0-15	0.0-2.0	0-5
	16-28	1.0-2.9	7.4-9.0	0-15	0.0-2.0	0-5
	28-41	1.0-2.9	6.6-8.4	0-10	0.0-2.0	0-5
	41-59	1.0-2.9	7.4-9.0	0-5	0.0-2.0	0-5
Pintobasin, rarely flooded-----	0-2	1.4-6.1	6.0-7.0	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
2110:						
Descent-----	0-2	2.0-6.1	7.9-8.4	1-10	0	0
	2-2	2.0-6.1	7.9-8.4	1-10	0	0
	2-7	3.6-7.6	7.9-9.0	5-16	0	0
	7-17	1.4-5.1	7.9-9.0	5-16	0	0
	17-59	1.4-3.8	7.9-9.0	5-15	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2110:						
Descent, stable-----	0-0	4.7-8.6	7.9-8.4	1-10	0	0
	0-1	4.7-8.6	7.9-8.4	1-10	0	0
	1-7	3.6-7.6	7.9-9.0	5-16	0	0
	7-17	1.4-5.1	7.9-9.0	5-16	0	0
	17-59	1.4-3.8	7.9-9.0	5-15	0	0
2111:						
Descent, warm-----	0-2	2.0-6.1	7.9-8.4	1-10	0	0
	2-2	2.0-6.1	7.9-8.4	1-10	0	0
	2-7	3.6-7.6	7.9-9.0	5-16	0	0
	7-17	1.4-5.1	7.9-9.0	5-16	0	0
	17-59	1.4-3.8	7.9-9.0	5-15	0	0
Rubylee, very rarely flooded-----	0-2	6.2-12.5	6.6-8.4	0-5	0	0
	2-5	7.6-14.3	7.4-8.4	0-1	0	0
	5-18	7.6-14.3	7.4-8.4	0-1	0	0
	18-59	2.6-12.9	7.4-9.0	0-1	0	0
2120:						
Rizzo, rarely flooded	0-1	0.8-4.0	7.4-8.4	0	0	0
	1-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
Deprave-----	0-1	8.9-14.0	7.4-8.4	0-5	0	0
	1-2	8.9-13.2	7.4-8.4	0-5	0	0
	2-13	10.9-19.9	7.4-8.4	0-10	0	0
	13-33	1.0-3.7	6.6-8.4	0-15	0	0
	33-63	1.0-2.0	6.6-8.4	0-15	0	0
Rizzo, frequently flooded-----	0-4	0.8-4.5	7.4-8.4	0	0	0
	4-12	0.8-4.5	7.4-8.4	0	0	0
	12-59	0.8-3.6	7.4-8.4	0	0	0
2121:						
Rizzo, rubbly-----	0-1	3.1-9.9	7.4-8.4	0	0	0
	1-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
2130:						
Goldenbell-----	0-2	8.9-13.2	6.6-8.4	0-1	0	0
	2-3	8.9-13.2	6.6-8.4	0-1	0	0
	3-11	10.9-15.7	7.4-8.4	0-1	0	0
	11-16	1.0-2.6	6.6-7.8	0-5	0	0
	16-59	1.0-2.6	6.6-7.8	0-1	0	0
Descent-----	0-1	2.0-6.1	7.9-8.4	1-10	0	0
	1-7	3.6-7.6	7.9-9.0	5-16	0	0
	7-17	1.4-5.1	7.9-9.0	5-16	0	0
	17-59	1.4-3.8	7.9-9.0	5-15	0	0
2140:						
Rockhound, cobbly----	0-3	6.2-13.2	7.4-8.4	0	0	0
	3-4	6.2-13.2	7.4-8.4	0-5	0	0
	4-34	8.9-14.3	7.4-8.4	0-10	0	0
	34-59	1.8-13.5	7.4-8.4	0-5	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2402:						
Rizzo-----	0-2	1.4-4.7	7.4-8.4	0	0	0
	2-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
Rizzo, frequently flooded-----	0-1	0.8-4.7	7.4-8.4	0	0	0
	1-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
2403:						
Rizzo-----	0-1	3.6-9.9	7.4-8.4	0	0	0
	1-7	0.8-4.5	7.4-8.4	0	0	0
	7-20	0.8-4.5	7.4-8.4	0	0	0
	20-59	0.8-3.6	7.4-8.4	0	0	0
Rizzo, occasionally flooded-----	0-4	0.8-4.5	7.4-8.4	0	0	0
	4-12	0.8-4.5	7.4-8.4	0	0	0
	12-59	0.8-3.6	7.4-8.4	0	0	0
2404:						
Rizzo, occasionally flooded-----	0-2	1.4-4.7	7.4-8.4	0	0	0
	2-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
Rizzo, very rarely flooded-----	0-1	0.8-4.0	7.4-8.4	0	0	0
	1-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
2405:						
Carrizo, rarely flooded-----	0-1	3.1-7.4	7.4-8.8	0-1	0	0
	1-5	1.4-6.1	6.8-8.2	1-3	0	0
	5-59	1.4-4.7	7.0-8.4	1-3	0	0
Carrizo, occasionally flooded	0-1	1.4-6.1	6.4-8.0	1-5	0	0
	1-5	1.4-6.1	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
2406:						
Pintobasin, frequently flooded--	0-3	1.4-4.7	6.0-7.0	0	0	0
	3-19	1.4-4.5	6.0-7.0	0	0	0
	19-59	0.8-4.5	6.2-7.8	0	0	0
Carrizo, occasionally flooded	0-1	1.4-6.1	6.4-8.0	1-5	0	0
	1-5	1.4-6.1	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2407:						
Pintobasin, rarely flooded-----	0-2	1.4-7.4	6.0-7.0	0	0	0
	2-4	1.4-4.5	6.2-7.4	0	0	0
	4-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
Carrizo, occasionally flooded	0-1	1.4-6.1	6.4-8.0	1-5	0	0
	1-5	1.4-6.1	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
Carrizo, frequently flooded-----	0-1	0.8-4.5	6.6-8.4	0	0	0
	1-5	1.4-6.1	6.8-8.2	1-5	0	0
	5-13	1.4-4.7	7.0-8.4	1-5	0	0
	13-59	1.4-4.7	7.0-8.4	0-1	0	0
2408:						
Rizzo, frequently flooded-----	0-4	0.8-4.5	7.4-8.4	0	0	0
	4-12	0.8-4.5	7.4-8.4	0	0	0
	12-59	0.8-3.6	7.4-8.4	0	0	0
Rizzo, very rarely flooded-----	0-2	1.4-4.7	7.4-8.4	0	0	0
	2-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
2409:						
Rizzo, frequently flooded-----	0-1	0.8-4.7	7.4-8.4	0	0	0
	1-4	0.8-4.5	7.4-8.4	0	0	0
	4-12	0.8-4.5	7.4-8.4	0	0	0
	12-59	0.8-3.6	7.4-8.4	0	0	0
Chemwash, frequently flooded-----	0-2	0.8-6.1	7.4-8.4	0-5	0.0-2.0	0-2
	2-67	0.8-4.7	7.4-8.4	0-5	0.0-2.0	0-2
Carsitas, occasionally flooded, braided----	0-1	1.4-5.1	6.6-8.4	0-1	0	0
	1-59	0.8-3.1	7.4-8.4	0-1	0	0
2420:						
Carsitas, frequently flooded-----	0-1	1.4-4.0	6.6-8.4	0	0	0
	1-59	0.8-3.1	7.4-8.4	0-1	0	0
Carsitas, occasionally flooded	0-1	1.4-4.0	6.6-8.4	0	0	0
	1-59	0.8-3.1	7.4-8.4	0-1	0	0
Carsitas, rarely flooded-----	0-1	3.1-5.4	6.6-8.4	0	0	0
	1-59	0.8-3.1	7.4-8.4	0-1	0	0



# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2421:						
Carsitas, very rarely flooded-----	0-1	0.8-5.4	6.0-7.8	0	0	0
	1-59	0.8-3.1	7.4-8.4	0-1	0	0
Carsitas, rarely flooded-----	0-1	3.1-5.4	6.6-8.4	0	0	0
	1-59	0.8-3.1	7.4-8.4	0-1	0	0
2431:						
Chemwash, frequently flooded, braided----	0-2	0.8-6.1	7.4-8.4	0-5	0.0-2.0	0-2
	2-67	0.8-4.7	7.4-8.4	0-5	0.0-2.0	0-2
Chemwash, frequently flooded-----	0-2	0.8-6.1	7.4-8.4	0-5	0.0-2.0	0-2
	2-67	0.8-4.7	7.4-8.4	0-5	0.0-2.0	0-2
2440:						
Rizzo-----	0-1	0.8-4.7	7.4-8.4	0	0	0
	1-4	0.8-4.5	7.4-8.4	0	0	0
	4-12	0.8-4.5	7.4-8.4	0	0	0
	12-59	0.8-3.6	7.4-8.4	0	0	0
Rizzo, occasionally flooded-----	0-1	0.8-4.7	7.4-8.4	0	0	0
	1-4	0.8-4.5	7.4-8.4	0	0	0
	4-12	0.8-4.5	7.4-8.4	0	0	0
	12-59	0.8-3.6	7.4-8.4	0	0	0
Rizzo, extremely stony-----	0-1	3.1-9.4	7.4-8.4	0	0	0
	1-9	0.8-4.5	7.4-8.4	0	0	0
	9-19	0.8-4.5	7.4-8.4	0	0	0
	19-59	0.8-3.6	7.4-8.4	0	0	0
2715:						
Dalelake-----	0-2	0.8-2.6	6.6-7.8	0	0	0
	2-59	0.8-2.4	6.6-8.4	0	0	0
Sheephole-----	0-1	0.8-4.0	6.6-8.4	0	0	0
	1-6	0.8-3.8	6.6-8.4	0	0	0
	6-22	0.8-3.8	6.6-8.4	0	0	0
	22-29	0.8-3.8	6.6-8.4	0	0	0
	29-42	0.8-3.1	7.4-8.4	0	0	0
	42-59	0.8-3.8	6.6-8.4	0	0	0
Pintobasin-----	0-1	1.4-4.7	6.0-7.0	0	0	0
	1-8	1.4-4.5	6.2-7.4	0	0	0
	8-24	0.8-4.5	6.0-7.8	0	0	0
	24-59	0.8-4.5	6.5-8.0	0	0	0
2716:						
Dalelake, steep-----	0-4	0.8-2.6	6.6-7.8	0	0	0
	4-59	0.8-2.4	6.6-8.4	0	0	0
Dalelake-----	0-4	0.8-2.6	6.6-7.8	0	0	0
	4-59	0.8-2.4	6.6-8.4	0	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2717:						
Dalelake-----	0-4	0.8-2.6	6.6-7.8	0	0	0
	4-59	0.8-2.4	6.6-8.4	0	0	0
Buzzardsprings, fine sand-----	0-2	1.9-5.3	7.0-8.2	0	0	0
	2-3	1.0-7.9	7.4-8.4	0-5	0	0
	3-8	1.0-7.9	7.4-8.2	0-5	0	0
	8-23	1.0-5.1	8.0-8.6	5-10	0	0
	23-60	1.0-5.1	7.4-8.4	0-5	0	0
2718:						
Dalelake-----	0-4	0.8-2.6	6.6-7.8	0	0	0
	4-59	0.8-2.4	6.6-8.4	0	0	0
Sheephole, gravelly surface-----	0-1	0.8-4.0	6.6-8.4	0	0	0
	1-6	0.8-3.8	6.6-8.4	0	0	0
	6-22	0.8-3.8	6.6-8.4	0	0	0
	22-29	0.8-3.8	6.6-8.4	0	0	0
	29-42	0.8-3.1	7.4-8.4	0	0	0
	42-59	0.8-3.8	6.6-8.4	0	0	0
2820:						
Impedimenta-----	0-1	2.0-4.7	6.6-8.4	0-1	0	0
	1-4	1.4-3.1	6.6-8.4	0-1	0	0
	4-14	---	---	---	---	---
2825:						
Supplymine-----	0-6	1.8-7.1	6.6-8.4	0-5	0	0
	6-7	1.8-7.1	6.6-8.4	0-5	0	0
	7-20	4.8-9.2	7.4-9.0	5-40	0	0
	20-33	4.8-13.9	7.4-9.0	5-40	0	0
	33-43	---	---	---	---	---
Bolero, dry-----	0-6	1.4-4.7	7.4-8.4	0	0	0
	6-7	1.4-4.7	7.4-8.4	0	0	0
	7-12	2.5-7.0	7.4-8.4	0	0	0
	12-15	2.5-7.0	7.4-8.4	0	0	0
	15-19	2.5-7.0	7.4-8.4	0	0	0
	19-29	---	---	---	---	---
Ironage-----	0-6	4.8-7.9	6.6-8.4	1-5	0	0
	6-9	4.8-7.9	6.6-8.4	1-5	0	0
	9-13	6.2-12.1	7.9-8.4	5-20	0	0
	13-18	6.2-11.8	7.9-8.4	5-20	0	0
	18-24	6.2-11.8	7.9-8.4	5-25	0	0
	24-33	---	---	---	---	---
2830:						
Blackeagle, cool----	0-8	4.8-7.9	6.6-7.6	0	0	0
	8-9	4.8-7.9	6.6-7.6	0	0	0
	9-16	6.2-13.6	7.0-8.0	1-3	0	0
	16-30	---	---	---	---	---
2835:						
Blackeagle-----	0-5	4.8-10.2	6.2-8.0	0	0	0
	5-7	6.2-10.2	6.6-8.0	0	0	0
	7-17	6.2-13.6	7.0-8.0	1-3	0	0
	17-27	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
2840:						
Jadestorm-----	0-2	4.8-10.2	6.6-8.0	0-1	0	0
	2-3	4.8-10.2	6.6-8.0	0-1	0	0
	3-10	4.8-12.9	7.8-8.2	0-1	0	0
	10-17	---	---	---	---	---
	17-26	---	---	---	---	---
3110:						
Coppermine, cool----	0-1	4.8-10.2	6.6-8.4	0-1	0	0
	1-4	3.3-9.9	6.6-8.4	0-1	0	0
	4-8	8.9-15.7	6.6-7.8	0-1	0	0
	8-11	14.2-17.1	6.6-7.8	0-1	0	0
	11-20	---	---	---	---	---
Stranger-----	0-1	0.8-6.1	6.6-7.8	0-1	0	0
	1-3	0.8-3.1	6.6-8.4	0-1	0	0
	3-13	---	---	---	---	---
3120:						
Aguilareal-----	0-3	3.3-7.1	6.6-8.4	0	0	0
	3-4	3.3-6.3	6.6-8.4	0-1	0.0-2.0	0-5
	4-14	6.2-13.6	6.6-8.4	0-1	0.0-2.0	0-5
	14-19	6.2-13.6	6.6-8.4	0-1	0.0-2.0	0-5
	19-29	---	---	---	---	---
Blackeagle-----	0-5	4.8-10.2	6.2-8.0	0	0	0
	5-7	6.2-10.2	6.6-8.0	0	0	0
	7-17	6.2-13.6	7.0-8.0	1-3	0	0
	17-27	---	---	---	---	---
3213:						
Dalvord-----	0-2	4.1-12.5	7.2-8.4	0-1	0	0
	2-3	4.1-12.5	7.2-8.4	0-1	0.0-2.0	0-4
	3-5	6.2-12.5	7.2-8.4	0-5	0.0-2.0	0-4
	5-14	6.2-12.5	7.2-8.4	0-5	0.0-2.0	0-4
	14-24	---	---	0-5	---	---
Aguilareal-----	0-3	3.3-7.1	6.6-8.4	0	0	0
	3-5	3.3-6.3	6.6-8.4	0-1	0.0-2.0	0-4
	5-14	6.2-13.6	6.6-8.4	0-1	0.0-2.0	0-4
	14-19	6.2-13.6	6.6-8.4	0-1	0.0-2.0	0-4
	19-29	---	---	---	---	---
3242:						
Langwell-----	0-1	6.2-12.5	7.4-8.4	0-1	0	0
	1-4	6.2-12.5	7.4-8.4	0-5	0	0
	4-14	---	---	---	---	---
Helendale, cool----	0-10	3.3-7.1	7.2-8.0	0	0	0
	10-37	6.2-14.3	7.2-8.4	0	0	0
	37-59	6.2-14.3	7.2-8.4	0	0	0
3285:						
Pinecity-----	0-1	2.0-5.7	7.4-8.0	0-1	0	0
	1-7	2.0-5.7	7.4-8.2	0-1	0	0
	7-59	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
3285:						
Contactmine-----	0-1	4.8-14.7	6.6-7.8	0	0	0-4
	1-5	5.5-14.3	6.6-7.8	0	0	0-4
	5-9	12.2-22.7	7.4-7.8	0	0	0-4
	9-22	12.9-21.3	7.4-8.4	0-1	0	0-4
	22-26	11.6-17.1	7.9-8.4	0-1	0	0-4
	26-59	---	---	---	---	---
Desertqueen-----	0-4	4.8-8.6	6.1-7.8	0	0.0-2.0	0-5
	4-11	7.6-14.3	6.1-7.8	0	0	0
	11-59	---	---	0	0	0
3286:						
Pinecity, gravelly loamy sand-----	0-2	2.0-5.7	7.4-8.0	0-1	0.0-2.0	0-4
	2-4	2.0-5.7	7.4-8.0	0-1	0.0-2.0	0-4
	4-59	---	---	---	---	---
3291:						
Smithcanyon-----	0-3	1.7-5.0	6.8-7.4	0-1	0.0-2.0	0-5
	3-59	---	---	---	---	---
Stubbespring-----	0-1	2.6-4.8	7.0-7.8	0	0.0-2.0	0-4
	1-4	3.3-12.0	7.0-7.8	0	0.0-2.0	0-4
	4-13	6.2-14.3	7.4-8.0	0	0.0-2.0	0-4
	13-59	---	---	---	---	---
3292:						
Smithcanyon-----	0-2	1.4-5.0	6.1-7.8	0-1	0.0-2.0	0-5
	2-7	1.4-4.9	6.1-7.8	0-1	0.0-2.0	0-5
	7-59	---	---	---	---	---
Pinecity-----	0-2	1.4-6.7	6.6-7.8	0-1	0.0-2.0	0-4
	2-7	1.4-6.7	6.6-8.4	0-1	0.0-2.0	0-4
	7-59	---	---	---	---	---
3293:						
Smithcanyon-----	0-1	1.4-5.0	6.1-7.8	0-1	0.0-2.0	0-4
	1-7	1.4-4.9	6.1-7.8	0-1	0.0-2.0	0-4
	7-59	---	---	---	---	---
Pinecity-----	0-2	1.4-6.7	6.6-7.8	0-1	0.0-2.0	0-5
	2-7	1.4-6.7	6.6-7.8	0-1	0.0-2.0	0-5
	7-59	---	---	---	---	---
3294:						
Smithcanyon, dry----	0-1	1.4-5.0	6.6-7.8	0-1	0.0-2.0	0-5
	1-9	1.4-5.0	6.1-7.8	0-1	0.0-2.0	0-5
	9-59	---	---	---	---	---
3295:						
Desertqueen, dry----	0-4	4.8-8.6	6.1-7.8	0	0.0-2.0	0-5
	4-11	7.6-14.3	6.1-7.8	0	0	0
	11-59	---	---	0	0	0
Hexie-----	0-1	4.8-8.6	7.2-7.8	0-1	0.0-2.0	0-5
	1-5	4.8-8.4	7.2-7.8	0-1	0.0-2.0	0-5
	5-9	8.9-13.6	7.4-8.0	0-1	0.0-2.0	0-5
	9-39	6.2-13.6	7.4-8.0	0-3	0.0-2.0	0-5
	39-59	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
3296:						
Desertqueen-----	0-2	1.8-3.8	6.1-7.8	0	0.0-2.0	0-5
	2-5	3.3-6.9	6.1-7.3	0	0.0-2.0	0-5
	5-13	7.6-12.1	6.1-7.8	0	0.0-2.0	0-5
	13-59	---	---	---	---	---
Pinecity-----	0-2	1.4-6.7	7.0-8.0	0-1	0	0
	2-6	0.8-5.7	7.0-8.0	0-1	0	0
	6-59	---	---	---	---	---
3297:						
Desertqueen, warm----	0-2	4.8-8.6	6.1-7.8	0	0.0-2.0	0-5
	2-5	7.6-14.3	6.1-7.8	0	0	0
	5-59	---	---	0	0	0
Contactmine, dry-----	0-2	4.8-14.7	6.6-7.8	0	0	0-4
	2-5	5.5-14.3	6.6-7.8	0	0	0-4
	5-12	12.2-22.7	7.4-7.8	0	0	0-4
	12-22	12.9-21.3	7.4-8.4	0-1	0	0-4
	22-47	6.2-14.3	7.4-8.4	0-1	0	0-4
	47-59	---	---	---	---	---
Seanna, dry-----	0-1	6.2-14.7	7.4-7.8	0-1	0.0-2.0	0-4
	1-8	6.2-14.7	7.4-7.8	0-1	0.0-2.0	0-4
	8-15	6.2-14.3	7.8-8.2	0-1	0.0-2.0	0-4
	15-59	---	---	---	---	---
3325:						
Ironped, warm-----	0-2	2.0-5.7	7.4-8.0	0	0	0
	2-7	1.4-5.7	7.4-8.2	0	0	0
	7-59	---	---	---	---	---
Hexie-----	0-3	4.8-8.6	7.2-7.8	0-1	0.0-2.0	0-5
	3-13	8.9-13.6	7.4-8.0	0-1	0.0-2.0	0-5
	13-35	6.2-13.6	7.4-8.0	0-3	0.0-2.0	0-5
	35-59	---	---	---	---	---
Ironped-----	0-2	2.0-5.7	7.4-8.0	0	0	0
	2-7	1.4-5.7	7.4-8.2	0	0	0
	7-59	---	---	---	---	---
3335:						
Xeric Torriorthents--	0-9	0.8-12.4	6.6-8.4	0-1	0.0-2.0	0-4
	9-26	0.8-8.9	6.6-8.4	0-1	0.0-2.0	0-4
	26-36	0.8-8.9	6.6-8.4	0-1	0.0-2.0	0-4
	36-50	0.8-8.9	6.6-8.4	0-1	0.0-2.0	0-4
	50-59	---	---	---	---	---
Xeric Torriorthents, warm-	0-9	0.8-12.4	6.6-8.4	0-1	0.0-2.0	0-4
	9-26	0.8-8.9	6.6-8.4	0-1	0.0-2.0	0-4
	26-36	0.8-8.9	6.6-8.4	0-1	0.0-2.0	0-4
	36-50	0.8-8.9	6.6-8.4	0-1	0.0-2.0	0-4
	50-59	---	---	---	---	---
3336:						
Xeric Torriorthents--	0-9	0.8-12.4	6.6-8.4	0-1	0.0-2.0	0-4
	9-26	0.8-8.9	6.6-8.4	0-1	0.0-2.0	0-4
	26-36	0.8-8.9	6.6-8.4	0-1	0.0-2.0	0-4
	36-50	0.8-8.9	6.6-8.4	0-1	0.0-2.0	0-4
	50-59	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
3336:						
Bigbernie-----	0-1	1.4-4.0	6.6-8.4	0-1	0.0-2.0	0-4
	1-4	1.4-3.8	7.4-8.4	0-1	0.0-2.0	0-4
	4-24	0.8-3.1	7.4-8.4	0-1	0.0-2.0	0-4
	24-59	---	---	---	---	---
3340:						
Seanna-----	0-1	4.8-11.7	7.4-7.8	0-1	0.0-2.0	0-4
	1-6	6.2-14.3	7.4-7.8	0-1	0.0-2.0	0-4
	6-17	6.2-14.3	7.6-8.2	0-1	0.0-2.0	0-4
	17-59	---	---	---	---	---
Grubstake, moist-----	0-2	4.8-8.4	7.4-8.4	0-1	0	0
	2-3	4.8-8.2	7.4-8.4	0-1	0	0
	3-18	6.2-12.1	7.4-8.4	0-1	0	0
	18-30	---	---	---	---	---
	30-39	---	---	---	---	---
Pinecity-----	0-2	3.1-7.1	7.2-7.8	0-1	0	0
	2-9	3.1-6.1	7.2-7.8	0-1	0	0
	9-59	---	---	---	---	---
3345:						
Bigcanyon-----	0-0	0.8-4.0	6.6-7.3	0-1	0.0-2.0	0-4
	0-14	0.8-3.1	6.6-7.8	0-1	0.0-2.0	0-4
	14-20	0.8-3.1	6.6-7.8	0-1	0.0-2.0	0-4
	20-59	---	---	---	---	---
Bigcanyon, cool-----	0-1	0.8-4.0	6.6-7.3	0-1	0.0-2.0	0-4
	1-9	0.8-3.1	6.6-7.8	0-1	0.0-2.0	0-4
	9-23	0.8-3.1	6.6-7.8	0-1	0.0-2.0	0-4
	23-59	---	---	---	---	---
3440:						
Pacific Mesa, steep--	0-3	4.8-7.1	7.4-8.4	0-5	0	0
	3-9	4.8-9.9	7.9-8.4	0-5	0	0
	9-16	4.8-8.4	7.9-8.4	0-5	0	0
	16-26	---	---	---	---	---
Pacific Mesa-----	0-0	4.8-7.1	7.4-8.4	0-5	0	0
	0-2	4.8-7.1	7.4-8.4	0-5	0	0
	2-9	4.8-9.9	7.9-8.4	0-5	0	0
	9-17	4.8-8.4	7.9-8.4	0-5	0	0
	17-26	---	---	---	---	---
3509:						
Cajon, very rarely flooded-----	0-1	1.4-4.7	7.2-7.3	0-1	0.0-2.0	0-4
	1-19	0.8-3.8	7.4-7.6	0-1	0.0-2.0	0-4
	19-38	0.8-3.1	7.6-7.8	0-1	0.0-2.0	0-4
	38-59	0.8-3.8	7.6-7.8	0-1	0.0-2.0	0-4
Friedliver-----	0-1	4.1-6.3	7.6-7.8	0	0.0-2.0	0-4
	1-16	4.1-5.3	7.6-7.8	0	0.0-2.0	0-4
	16-33	8.2-11.4	7.8-8.2	1-4	0.0-2.0	0-4
	33-59	9.6-12.5	7.8-8.0	1-4	0.0-2.0	0-4

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
3525:						
Cajon-----	0-1	0.8-5.4	6.0-7.0	0-1	0.0-2.0	0-5
	1-4	1.4-3.1	6.0-7.8	0-1	0.0-2.0	0-5
	4-20	0.8-3.1	7.6-8.0	0-1	0.0-2.0	0-5
	20-59	0.8-3.1	7.8-8.0	0-1	0.0-2.0	0-5
Friedliver-----	0-1	1.8-5.5	6.0-7.0	0-1	0.0-2.0	0-4
	1-5	1.8-7.1	6.2-7.8	0-1	0.0-2.0	0-4
	5-16	2.6-7.1	7.6-8.0	0-1	0.0-2.0	0-4
	16-32	7.6-11.7	7.8-8.2	0-1	0.0-2.0	0-4
	32-39	7.6-11.7	7.8-8.2	1-5	0.0-2.0	0-4
	39-59	4.8-9.4	8.0-8.4	1-5	0.0-2.0	0-4
3526:						
Cajon-----	0-1	0.8-5.4	7.2-7.3	0-1	0.0-2.0	0-5
	1-33	0.8-3.8	7.4-7.6	0-1	0.0-2.0	0-5
	33-61	0.8-3.1	7.6-7.8	0-1	0.0-2.0	0-5
Hypoint-----	0-1	0.8-4.0	6.6-8.4	0	0	0
	1-19	0.8-3.8	6.6-8.4	0	0	0
	19-59	0.8-3.8	6.6-8.4	0	0	0
Arizo, occasionally flooded-----	0-2	0.8-1.0	7.4-8.2	0	0	0
	2-10	0.8-0.9	7.4-8.2	0	0	0
	10-59	0.8-0.9	7.4-8.2	0	0	0
3611:						
Burntshack, sand surface-----	0-2	1.8-3.8	7.2-8.0	0-1	0	0
	2-7	3.3-3.7	7.2-8.0	0-1	0	0
	7-12	2.6-3.7	7.4-8.2	0-1	0	0
	12-30	4.1-5.3	7.4-8.2	0-1	0	0
	30-39	6.2-11.4	7.4-8.2	0-5	0	0
	39-59	1.8-3.7	7.4-8.4	0-5	0	0
Burntshack-----	0-2	1.8-5.5	7.2-8.0	0-1	0	0
	2-7	3.3-3.7	7.2-8.0	0-1	0	0
	7-12	2.6-3.7	7.4-8.2	0-1	0	0
	12-30	4.1-5.3	7.4-8.2	0-1	0	0
	30-39	6.2-11.4	7.4-8.2	0-5	0	0
	39-59	1.8-3.7	7.4-8.4	0-5	0	0
3612:						
Burntshack-----	0-2	1.4-4.7	7.2-8.0	0-1	0	0
	2-17	2.0-3.1	7.4-8.2	0-1	0	0
	17-27	3.1-4.5	7.4-8.2	0-1	0	0
	27-59	4.7-9.4	7.4-8.2	0-5	0	0
Burntshack, occasionally flooded	0-2	1.8-5.5	7.2-8.0	0-1	0	0
	2-17	2.6-3.7	7.4-8.2	0-1	0	0
	17-27	4.1-5.3	7.4-8.2	0-1	0	0
	27-59	6.2-11.4	7.4-8.2	0-5	0	0
3676:						
Morongo, loamy sand, very rarely flooded-	0-0	1.4-5.7	7.6-8.2	0-1	0.0-2.0	0-4
	0-20	1.4-5.7	7.6-8.2	0-1	0.0-2.0	0-4
	20-60	1.4-5.7	7.6-8.2	0-1	0.0-2.0	0-4

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
3677:						
Morongo-----	0-1	1.4-4.7	7.0-7.4	0	0	0
	1-6	1.4-5.7	6.6-7.6	0	0	0
	6-28	0.8-5.7	6.6-7.6	0	0	0
	28-59	1.4-4.0	6.6-7.6	0-1	0	0
3679:						
Morongo, cool-----	0-2	0.8-6.1	6.6-7.8	0-1	0.0-2.0	0-5
	2-6	1.4-5.7	6.6-7.8	0-1	0.0-2.0	0-5
	6-19	1.4-5.7	6.6-7.8	0-1	0.0-2.0	0-5
	19-59	0.8-5.7	6.6-8.4	0-1	0.0-2.0	0-5
Jumborox-----	0-1	1.8-4.6	6.1-7.8	0-1	0.0-2.0	0-5
	1-4	1.8-8.6	6.6-7.8	0-1	0.0-2.0	0-5
	4-14	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-5
	14-22	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-5
	22-37	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-5
	37-71	1.8-6.9	7.4-8.4	0-1	0.0-2.0	0-5
3680:						
Morongo-----	0-1	1.4-5.4	7.0-7.5	0-1	0.0-2.0	0-4
	1-2	0.8-3.8	7.4-7.8	0-1	0.0-2.0	0-4
	2-35	0.8-2.4	7.2-7.8	0-1	0.0-2.0	0-4
	35-59	0.8-2.4	7.2-8.0	0-1	0.0-2.0	0-4
3681:						
Morongo, very rarely flooded-----	0-1	1.4-4.7	7.0-7.4	0	0	0
	1-6	1.4-5.7	6.6-7.6	0	0	0
	6-28	0.8-5.7	6.6-7.6	0	0	0
	28-59	1.4-4.0	6.6-7.6	0-1	0	0
Jumborox, dry-----	0-1	1.8-4.6	6.1-7.8	0-1	0.0-2.0	0-4
	1-4	1.8-8.6	6.6-7.8	0-1	0.0-2.0	0-4
	4-14	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-4
	14-22	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-4
	22-37	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-4
	37-71	1.8-6.9	7.4-8.4	0-1	0.0-2.0	0-4
3682:						
Morongo, cool-----	0-2	0.8-6.1	6.6-7.8	0-1	0.0-2.0	0-5
	2-6	1.4-5.7	6.6-7.8	0-1	0.0-2.0	0-5
	6-19	1.4-5.7	6.6-7.8	0-1	0.0-2.0	0-5
	19-59	0.8-5.7	6.6-8.4	0-1	0.0-2.0	0-5
Jumborox-----	0-2	1.8-8.6	6.1-7.8	0-1	0.0-2.0	0-4
	2-8	1.8-8.6	6.6-7.8	0-1	0.0-2.0	0-4
	8-21	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-4
	21-33	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-4
	33-59	1.8-6.9	6.6-8.4	0-1	0.0-2.0	0-4
3683:						
Morongo-----	0-1	1.4-3.8	7.4-7.8	0-1	0	0
	1-59	0.8-3.1	7.6-8.0	0-1	0	0
Bluecut, very rarely flooded-----	0-1	3.3-8.6	7.4-7.8	0-1	0.0-2.0	0-4
	1-12	14.2-19.2	7.4-7.8	0-1	0.0-2.0	0-4
	12-26	3.3-11.4	7.4-8.0	0-1	0.0-2.0	0-4
	26-33	1.8-4.5	7.4-8.0	0-1	0.0-2.0	0-4
	33-59	1.8-2.8	7.6-8.0	0-1	0.0-2.0	0-4



# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
3684:						
Morongo, warm-----	0-1	1.4-5.7	6.6-7.8	0-1	0	0
	1-5	1.4-5.7	7.4-7.8	0-1	0	0
	5-16	1.4-5.7	6.6-7.8	0-1	0	0
	16-79	1.4-5.7	6.6-7.8	0-1	0	0
3685:						
Morongo, cool-----	0-2	0.8-6.1	6.6-7.8	0-1	0.0-2.0	0-4
	2-6	0.8-5.7	6.6-7.8	0-1	0.0-2.0	0-4
	6-19	1.4-5.7	6.6-7.8	0-1	0.0-2.0	0-4
	19-59	0.8-5.7	6.6-8.4	0-1	0.0-2.0	0-4
Desertqueen, undulating-----	0-3	3.3-7.1	6.1-7.8	0	0.0-2.0	0-5
	3-12	7.6-14.3	6.1-7.8	0-1	0	0
	12-59	---	---	---	---	---
3690:						
Nasagold-----	0-1	3.3-8.6	7.2-7.8	0	0.0-2.0	0-4
	1-6	3.3-8.4	7.2-7.8	0	0.0-2.0	0-4
	6-20	4.1-12.1	7.2-7.8	0	0.0-2.0	0-4
	20-37	4.1-12.1	7.2-7.8	0	0.0-2.0	0-4
	37-59	4.1-12.1	7.2-7.8	0	0.0-2.0	0-4
3695:						
Gocougs-----	0-2	2.6-5.5	7.4-8.4	0	0.0-2.0	0-5
	2-6	3.3-11.4	7.4-8.4	0	0.0-2.0	0-5
	6-33	10.3-20.6	6.6-8.4	0-6	0.0-2.0	0-5
	33-46	5.5-9.9	7.9-8.4	8-14	0.0-2.0	0-5
	46-65	0.1-1.8	7.9-8.4	1-6	0.0-2.0	0-5
4031:						
Crosgrain-----	0-1	6.2-12.1	8.0-8.4	0-1	0	0
	1-6	7.6-14.3	8.0-8.4	1-5	0	0
	6-13	6.2-9.9	8.0-8.4	1-5	0	0
	13-22	---	---	---	---	---
Crackerjack-----	0-1	6.2-12.5	7.6-8.4	0-1	0	0
	1-7	6.2-12.5	8.0-8.4	0-1	0	0
	7-13	7.6-12.5	8.0-8.4	1-15	0	0
	13-59	6.2-9.9	8.1-8.4	1-15	0	0
Pinkcan, dry-----	0-0	7.6-14.0	6.6-7.8	0	0	0
	0-11	10.9-22.0	6.6-8.4	0-1	0	0
	11-19	14.2-22.0	6.6-8.4	0-1	0	0
	19-25	10.9-18.5	6.6-8.4	0-1	0	0
	25-28	6.2-11.4	7.4-7.8	0-1	0	0
	28-33	6.2-11.4	7.4-7.8	0-1	0	0
	33-47	6.2-10.3	7.4-7.8	0-1	0	0
	47-60	3.3-8.3	7.9-8.4	0-1	0	0
4041:						
Silvermine-----	0-1	4.6-7.9	7.4-8.0	1-5	0	0
	1-7	2.6-6.5	7.6-8.2	1-10	0	0
	7-55	2.6-5.1	7.6-8.2	1-10	0	0
	55-59	2.6-6.5	8.4-8.8	5-15	0	0
Helendale-----	0-2	6.2-12.5	6.6-7.3	0-1	0	0-4
	2-16	6.2-14.7	7.4-7.8	0-1	0	0-4
	16-59	1.0-3.7	7.4-7.8	0-1	0	0-4

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
4041:						
Burntshack, very rarely flooded-----	0-2	1.8-5.5	7.2-8.0	0-1	0	0
	2-31	2.6-3.7	7.4-8.2	0-1	0	0
	31-43	6.2-11.4	7.4-8.2	0-5	0	0
	43-51	1.8-9.9	7.4-8.4	0-5	0	0
	51-59	6.2-9.9	7.4-8.2	0-1	0	0
4064:						
Gravesumit-----	0-1	3.3-5.5	6.6-8.4	0-1	0	0
	1-7	1.8-8.4	6.6-8.4	0-1	0	0
	7-13	6.2-14.3	7.4-9.0	0-1	0	0
	13-29	6.2-14.3	7.4-9.0	5-15	0	0
	29-41	1.8-4.5	6.6-8.4	0-1	0	0
	41-45	6.2-14.3	7.4-9.0	5-15	0	0
	45-60	1.8-6.9	6.6-8.4	0-1	0	0
Helendale, sandy surface-----	0-10	3.3-7.1	7.2-8.0	0	0	0
	10-37	6.2-14.3	7.2-8.4	0	0	0
	37-59	6.2-14.3	7.2-8.4	0	0	0
4071:						
Helendale-----	0-4	6.2-10.2	7.2-8.0	0	0	0
	4-37	6.2-14.3	7.2-8.4	0	0	0
	37-59	6.2-14.3	7.2-8.4	0	0	0
Desertqueen, very rarely flooded-----	0-2	4.8-8.6	6.1-7.8	0	0.0-2.0	0-5
	2-5	7.6-14.3	6.1-7.8	0	0	0
	5-12	7.6-14.3	6.1-7.8	0	0	0
	12-14	4.8-6.9	6.1-7.8	0	0.0-2.0	0-5
	14-59	---	---	0	0	0
4091:						
Littlefargo-----	0-1	2.6-5.5	6.6-7.8	0	0.0-2.0	0-5
	1-4	3.3-8.4	6.6-7.8	0	0.0-2.0	0-5
	4-31	6.2-14.3	6.6-7.8	0	0.0-2.0	0-5
	31-34	4.8-9.9	6.6-7.8	0	0.0-2.0	0-5
	34-59	---	---	---	---	---
4245:						
Bluecut-----	0-4	2.6-7.1	7.4-7.8	0-1	0.0-2.0	0-5
	4-11	2.6-9.9	7.4-7.8	0-1	0.0-2.0	0-5
	11-21	14.2-21.3	7.4-7.8	0-1	0.0-2.0	0-5
	21-26	2.6-11.4	7.4-7.8	0-1	0.0-2.0	0-5
	26-49	2.6-11.4	7.4-7.8	0-1	0.0-2.0	0-5
	49-79	1.8-9.9	7.4-8.4	0-1	0.0-2.0	0-5
Morongo, very rarely flooded-----	0-1	1.4-4.7	7.0-7.4	0	0	0
	1-6	1.4-5.7	6.6-7.6	0	0	0
	6-28	0.8-5.7	6.6-7.6	0	0	0
	28-59	1.4-4.0	6.6-7.6	0-1	0	0
Yander, very rarely flooded-----	0-2	2.0-3.3	6.1-7.6	0	0	0
	2-23	2.5-3.8	6.0-8.0	0	0	0
	23-40	1.4-5.1	6.1-7.6	0	0	0
	40-79	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
4260: Minhoyt-----	0-1	6.2-11.0	8.1-8.2	8-15	0.0-2.0	0-4
	1-2	1.8-9.2	8.0-8.2	5-15	0.0-2.0	0-4
	2-12	0.1-2.8	8.1-8.3	16-44	0.0-2.0	0-4
	12-59	---	---	---	---	---
Corbilt, rarely flooded-----	0-6	1.0-3.8	7.0-7.9	0-5	0.0-2.0	0
	6-14	1.0-6.1	7.8-7.9	0-5	0.0-2.0	0-4
	14-51	4.8-8.4	8.0-8.2	5-10	0.0-2.0	0-4
	51-59	0.1-2.8	8.0-8.2	---	0	0
4265: Werewolf, warm-----	0-2	5.5-11.7	7.5-8.0	0-1	0	0-4
	2-19	7.6-14.3	7.9-8.2	0-1	0	0-4
	19-24	10.3-12.9	7.6-7.8	0-1	0	0-4
	24-30	6.2-8.4	7.7-8.0	0-1	0	0-4
	30-59	5.5-6.9	7.8-8.0	0-1	0	0-4
4270: Yuccabutte, extremely cobbly sandy loam-----	0-2	8.9-16.2	7.4-7.8	0	0	0
	2-16	12.9-22.7	6.6-7.8	0	0	0
	16-30	12.9-22.7	6.6-7.8	0	0	0
	30-39	10.9-15.7	6.6-7.8	0	0	0
	39-53	7.6-12.1	6.6-7.8	0	0	0
	53-60	4.1-6.6	6.6-7.8	0	0	0
4271: Yuccabutte, warm-----	0-0	12.9-19.7	7.4-7.8	0	0	0
	0-6	14.2-26.0	6.6-7.8	0	0	0
	6-20	14.2-22.7	6.6-7.8	0	0	0
	20-39	10.9-15.7	6.6-7.8	0	0	0
	39-53	7.6-12.1	6.6-7.8	0	0	0
	53-60	4.1-6.6	6.6-7.8	0	0	0
Arizo, rarely flooded	0-2	2.0-4.0	7.2-8.2	0	0	0
	2-15	2.0-3.8	7.2-8.2	0	0	0
	15-59	0.8-0.9	7.2-8.2	0	0	0
4275: Pinkcan-----	0-1	7.6-15.4	6.6-7.8	0-1	0	0
	1-11	10.9-22.0	6.6-8.4	0-1	0	0
	11-19	14.2-22.0	6.6-8.4	0-1	0	0
	19-25	10.9-18.5	6.6-8.4	0-1	0	0
	25-28	6.2-11.4	7.4-7.8	0-1	0	0
	28-33	6.2-11.4	7.4-7.8	0-1	0	0
	33-47	6.2-10.3	7.4-7.8	0-1	0	0
	47-60	3.3-8.3	7.9-8.4	0-1	0	0
Werewolf-----	0-1	2.6-5.5	6.6-8.4	0	0	0
	1-15	6.2-12.1	7.4-8.4	0	0	0
	15-31	7.6-14.3	7.4-8.4	0-5	0	0
	31-41	7.6-14.3	7.4-8.4	0-5	0	0
	41-54	4.8-7.7	7.4-8.4	0-5	0	0
	54-65	4.8-7.7	7.4-8.4	0-5	0	0
Gocougs, warm-----	0-1	8.9-13.2	7.4-8.4	0-1	0.0-2.0	0-4
	1-8	6.2-21.3	7.2-8.4	0-1	0.0-2.0	0-4
	8-34	12.9-19.2	6.6-8.4	0-1	0.0-2.0	0-4
	34-39	4.1-6.9	7.9-8.4	5-10	0.0-2.0	0-4

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
4280:						
Mekkadale-----	0-1	6.2-12.9	7.4-8.4	0	0	0
	1-12	14.2-21.3	7.4-8.4	0-5	0	0
	12-19	10.9-14.3	7.4-8.2	0-5	0	0
	19-26	2.6-6.9	7.8-8.4	5-15	0	0
	26-59	2.6-6.6	7.8-8.4	5-15	0	0
Edalph, warm-----	0-2	4.0-9.4	6.6-8.6	1-5	0	0
	2-15	4.0-9.1	7.9-9.0	10-20	0	0
	15-20	4.0-7.9	7.9-9.0	10-20	0	0
	20-31	1.9-2.9	7.9-9.0	10-20	0	0
	31-59	1.9-4.4	6.6-9.0	1-10	0	0
4285:						
Typic Argidurids-----	0-1	7.6-10.2	7.9-8.4	0	0	0
	1-2	7.6-10.2	7.9-8.4	0	0	0
	2-7	12.9-17.6	7.9-8.4	0	0	0
	7-18	18.6-22.7	7.9-8.4	0	0	0
	18-23	9.8-15.1	7.9-9.4	0	0	0
	23-33	---	---	---	---	---
Coppermine-----	0-1	4.8-10.2	6.6-8.4	0-1	0	0
	1-8	8.9-15.7	6.6-7.8	0-1	0	0
	8-11	14.2-17.1	6.6-7.8	0-1	0	0
	11-20	---	---	---	---	---
Minhoyt, warm-----	0-1	6.9-11.0	8.1-8.2	5-15	0.0-2.0	0-4
	1-7	1.8-9.6	8.0-8.2	5-15	0.0-2.0	0-4
	7-59	---	---	---	---	---
4403:						
Arizo, rarely flooded, channeled--	0-6	0.8-1.0	7.6-8.2	0	0	0
	6-59	0.8-0.9	7.6-8.2	0	0	0
Arizo, rarely flooded	0-6	0.8-1.0	7.6-8.2	0	0	0
	6-59	0.8-0.9	7.6-8.2	0	0	0
Arizo-----	0-4	3.1-4.7	7.6-8.2	0	0	0
	4-59	0.8-0.9	7.6-8.2	0	0	0
4440:						
Dragonwash, occasionally flooded	0-1	0.8-5.4	7.4-7.8	0	0.0-2.0	0-4
	1-5	0.8-1.7	7.4-7.8	0-4	0.0-2.0	0-5
	5-59	0.8-1.7	7.4-8.4	0-4	0.0-2.0	0-5
Dragonwash, frequently flooded--	0-1	0.1-0.8	7.4-7.8	0	0.0-2.0	0-4
	1-10	0.8-1.7	7.4-7.8	0-4	0.0-2.0	0-4
	10-59	0.8-1.7	7.4-8.4	0-4	0.0-2.0	0-4
4450:						
Morongo, occasionally flooded	0-6	1.4-5.7	7.2-8.2	0	0	0
	6-18	1.4-5.7	7.6-8.2	0	0	0
	18-60	1.4-5.7	7.6-8.2	0-1	0	0
Morongo, frequently flooded-----	0-2	1.4-5.7	7.6-8.2	0	0	0
	2-7	1.4-5.7	7.0-8.2	0	0	0
	7-60	1.4-5.7	7.6-8.2	0-1	0	0

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
4605:						
Pinecity, moist-----	0-1	2.0-6.7	7.4-8.0	0-1	0	0
	1-8	2.0-5.7	7.4-8.0	0-1	0	0
	8-59	---	---	---	---	---
4606:						
Pinecity-----	0-1	1.4-6.7	6.6-7.8	0-1	0.0-2.0	0-5
	1-6	0.8-6.1	6.6-8.4	0-1	0.0-2.0	0-5
	6-59	---	---	---	---	---
4607:						
Pinecity-----	0-2	1.4-6.7	7.0-8.0	0-1	0	0
	2-6	0.8-5.7	7.0-8.0	0-1	0	0
	6-59	---	---	---	---	---
4608:						
Pinecity-----	0-2	2.0-6.7	7.0-8.0	0-1	0	0
	2-5	0.8-5.7	7.0-8.0	0-1	0	0
	5-59	---	---	---	---	---
4610:						
Desertqueen-----	0-2	4.8-8.6	6.1-7.8	0	0.0-2.0	0-5
	2-5	7.6-14.3	6.1-7.8	0	0	0
	5-12	7.6-14.3	6.1-7.8	0	0	0
	12-14	4.8-6.9	6.1-7.8	0	0.0-2.0	0-5
	14-59	---	---	0	0	0
Jumborox, warm-----	0-1	1.8-8.6	6.1-7.8	0	0	0
	1-3	1.8-8.6	6.1-7.8	0	0	0
	3-17	4.8-14.3	6.6-8.4	0	0	0
	17-28	4.8-14.3	6.6-8.4	0	0	0
	28-53	1.8-6.9	6.1-8.4	0	0	0
	53-71	1.8-6.9	6.1-7.8	0	0	0
4615:						
Desertqueen, cool----	0-3	4.8-8.6	6.1-7.8	0	0.0-2.0	0-4
	3-13	7.6-14.3	6.1-7.8	0	0	0-4
	13-59	---	---	0	0	0
Jumborox-----	0-1	1.8-4.6	6.1-7.8	0-1	0.0-2.0	0-4
	1-4	1.8-8.6	6.6-7.8	0-1	0.0-2.0	0-4
	4-14	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-4
	14-22	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-4
	22-37	4.8-14.3	6.6-8.4	0-1	0.0-2.0	0-4
	37-71	1.8-6.9	7.4-8.4	0-1	0.0-2.0	0-4
4620:						
Stranger-----	0-1	0.8-6.1	6.6-7.8	0-1	0	0
	1-3	0.8-3.1	6.6-8.4	0-1	0	0
	3-13	---	---	---	---	---
Grubstake, moist-----	0-1	3.3-7.1	7.4-8.4	0-1	0	0
	1-15	6.2-12.1	7.4-8.4	0-1	0	0
	15-18	---	---	---	---	---
	18-28	---	---	---	---	---
4625:						
Grinder-----	0-0	6.2-12.5	6.6-7.8	0-1	0	0
	0-3	8.9-17.8	7.4-8.4	0-1	0	0
	3-8	10.9-14.3	7.4-8.4	0-1	0	0
	8-18	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
4625:						
Grinder, cool-----	0-1	6.2-10.2	6.6-7.8	0-1	0	0
	1-3	8.9-17.8	7.4-8.4	0-1	0	0
	3-8	10.9-14.3	7.4-8.4	0-1	0	0
	8-18	---	---	---	---	---
Pinkcan, cool-----	0-0	7.6-14.0	6.6-7.8	0	0	0
	0-11	10.9-22.0	6.6-8.4	0-1	0	0
	11-19	14.2-22.0	6.6-8.4	0-1	0	0
	19-25	10.9-18.5	6.6-8.4	0-1	0	0
	25-28	6.2-11.4	7.4-7.8	0-1	0	0
	28-33	6.2-11.4	7.4-7.8	0-1	0	0
	33-47	6.2-10.3	7.4-7.8	0-1	0	0
	47-60	3.3-8.3	7.9-8.4	0-1	0	0
4630:						
Thunderclap-----	0-2	1.4-3.3	7.4-8.4	0-1	0.0-2.0	0-4
	2-11	1.4-3.3	7.4-8.4	0-1	0.0-2.0	0-4
	11-39	0.8-3.1	7.4-8.4	0-1	0.0-2.0	0-4
	39-63	0.8-3.1	7.4-8.4	0-1	0.0-2.0	0-4
	63-79	---	---	---	---	---
Smithcanyon-----	0-1	1.4-5.0	6.1-7.8	0-1	0.0-2.0	0-4
	1-8	1.4-5.0	6.1-7.8	0-1	0.0-2.0	0-4
	8-13	1.4-4.9	6.1-7.8	0-1	0.0-2.0	0-4
	13-59	---	---	---	---	---
4804:						
Ironped-----	0-2	2.0-5.7	7.4-8.0	0-1	0	0
	2-59	---	---	---	---	---
Pinecity-----	0-1	1.4-6.7	6.6-7.8	0-1	0.0-2.0	0-4
	1-6	0.8-6.1	6.6-8.4	0-1	0.0-2.0	0-4
	6-59	---	---	---	---	---
4805:						
Ironped, cool-----	0-2	2.0-5.7	7.4-8.0	0-1	0	0
	2-59	---	---	---	---	---
4811:						
Pioneertown-----	0-4	1.7-5.0	7.2-7.6	0	0.0-2.0	0-4
	4-10	1.7-6.1	7.0-7.2	0	0.0-2.0	0-4
	10-20	---	---	---	---	---
4825:						
Grubstake-----	0-1	3.3-7.1	7.4-8.4	0-1	0	0
	1-15	6.2-12.1	7.4-8.4	0-1	0	0
	15-18	---	---	---	---	---
	18-28	---	---	---	---	---
Cajon, rarely flooded	0-1	1.4-4.7	7.2-7.3	0-1	0.0-2.0	0-4
	1-19	0.8-3.8	7.4-7.6	0-1	0.0-2.0	0-4
	19-38	0.8-3.1	7.6-7.8	0-1	0.0-2.0	0-4
	38-59	0.8-3.8	7.6-7.8	0-1	0.0-2.0	0-4
Stranger, warm-----	0-1	0.8-4.0	6.6-7.8	0-1	0	0
	1-9	0.8-3.1	6.6-8.4	0-1	0	0
	9-19	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 22.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
4830:						
Pinecity, cool-----	0-1	1.4-6.7	6.6-7.8	0-1	0.0-2.0	0-5
	1-6	0.8-6.1	6.6-8.4	0-1	0.0-2.0	0-5
	6-59	---	---	---	---	---
4900:						
Aguilareal-----	0-3	3.3-7.1	6.6-8.4	0	0	0
	3-4	3.3-6.3	6.6-8.4	0-1	0.0-2.0	0-5
	4-14	6.2-13.6	6.6-8.4	0-1	0.0-2.0	0-5
	14-19	6.2-13.6	6.6-8.4	0-1	0.0-2.0	0-5
	19-29	---	---	---	---	---
Lostpalms-----	0-1	2.0-7.4	6.6-7.8	0	0.0-2.0	0-4
	1-7	2.0-6.4	7.4-8.4	0	0.0-2.0	0-4
	7-17	---	---	---	---	---

Table 23.-Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Kind	Restrictive layer		Hardness	Potential for frost action	Risk of corrosion	
		Depth to top	Thickness			Uncoated steel	Concrete
		In	In				
1220:							
Jadestorm-----	Paralithic bedrock	4-14	2-7	Moderately cemented	None	Low	Low
	Lithic bedrock	6-20	---	Very strongly cemented			
Blackeagle, cool-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Rock outcrop.							
Whipple-----	Lithic bedrock	5-14	10-10	Very strongly cemented	None	Low	Low
Dalelake, thick sandy surface-----	---	---	---	---	None	Low	Low
Carriazo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
1225:							
Blackeagle-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Rock outcrop.							
Jadestorm-----	Paralithic bedrock	4-14	2-7	Moderately cemented	None	Low	Low
	Lithic bedrock	6-20	---	Very strongly cemented			
Carriazo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
Whipple, moist-----	Lithic bedrock	5-14	10-10	Very strongly cemented	None	Low	Low
1230:							
Jadestorm-----	Paralithic bedrock	4-14	2-7	Moderately cemented	None	Low	Low
	Lithic bedrock	6-20	---	Very strongly cemented			
Jadestorm, cool-----	Paralithic bedrock	4-14	2-7	Moderately cemented	None	Low	Low
	Lithic bedrock	6-20	---	Very strongly cemented			



Table 23.-Soil Features-Continued

Map unit symbol and soil name	Kind	Restrictive layer		Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness	Uncoated steel	Concrete
1230: Rock outcrop.						
Meccapass, dry-----	Paralithic bedrock	20-39	---	Moderately cemented	Low	Low
Meccapass-----	Paralithic bedrock	20-39	---	Moderately cemented	Low	Low
Carrizo, occasionally flooded, channeled-----	---	---	---	---	Low	Low
Dalelake-----	---	---	---	---	Low	Low
1240: Meccapass-----	Paralithic bedrock	20-39	---	Moderately cemented	Low	Low
Bulletproof-----	Paralithic bedrock	10-14	---	Moderately cemented	Low	Low
Rock outcrop.						
Meccapass-----	Paralithic bedrock	20-39	---	Moderately cemented	Low	Low
Jadestorm, moist-----	Paralithic bedrock Lithic bedrock	4-14 6-20	2-7 ---	Moderately cemented Very strongly cemented	Low	Low
Seanna-----	Paralithic bedrock	7-7	---	Moderately cemented	Low	Low
Fanhill, moist-----	Paralithic bedrock	14-20	---	Weakly cemented	Low	Low
Marbolite, cool-----	Lithic bedrock	14-20	---	Very strongly cemented	Low	Low
Carrizo, occasionally flooded-----	---	---	---	---	Low	Low
1241: Meccapass-----	Paralithic bedrock	20-39	---	Moderately cemented	Low	Low
Seanna-----	Paralithic bedrock	4-14	---	Moderately cemented	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Hardness		Uncoated steel	Concrete
		In	Thickness				
1241: Contactmine, dry-----	Paralithic bedrock	20-39	---	Weakly cemented	None	Low	Low
Rock outcrop.							
Cajon, rarely flooded-----	---	---	---	---	None	Low	Low
Whiterobe-----	Paralithic bedrock	20-39	---	Moderately cemented	None	Low	Low
Ironped, moist-----	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low
1242: Meccapass-----	Paralithic bedrock	20-39	---	Moderately cemented	None	Low	Low
Jadestorm-----	Paralithic bedrock Lithic bedrock	4-14 6-20	2-11 ---	Moderately cemented Very strongly cemented	None	Low	Low
Rock outcrop.							
Contactmine, hot-----	Paralithic bedrock	20-30	---	Moderately cemented	None	Low	Low
Meccapass, cool-----	Paralithic bedrock	20-39	---	Moderately cemented	None	Low	Low
Bulletproof-----	Paralithic bedrock	10-14	---	Moderately cemented	None	Low	Low
Jadestorm, moist-----	Paralithic bedrock Lithic bedrock	4-14 6-26	2-11 ---	Moderately cemented Very strongly cemented	None	Low	Low
Carrizo, occasionally flooded-----	---	---	---	---	None	Low	Low
Fanhill, moist-----	Paralithic bedrock	14-20	---	Weakly cemented	None	Low	Low

Table 23.-Soil Features-Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion		
	Kind	Depth	Thickness			Hardness	Uncoated steel	Concrete
		In	to top	In				
1250: Ironlung-----	Paralithic bedrock							
			4-14	---	Weakly cemented	None	Low	Low
			4-14	---	Moderately cemented	None	Low	Low
Rock outcrop.								
Ironlung, rubbly, cool-----	Paralithic bedrock	4-14		---	Weakly cemented	None	Low	Low
Ironped, cool-----	Paralithic bedrock	2-14		---	Weakly cemented	None	Low	Low
Whiterobe-----	Paralithic bedrock	20-39		---	Weakly cemented	None	Low	Low
Carrizo, occasionally flooded-----	---	---		---	---	None	Low	Low
Whiterobe, cool-----	Paralithic bedrock	20-39		---	Weakly cemented	None	Low	Low
Bolero, moist-----	Lithic bedrock	14-20		---	Very strongly cemented	None	Low	Low
Pintobasin, steep, moist-----	---	---		---	---	None	Low	Low
1255: Goldenhills-----	Lithic bedrock	39-59		---	Indurated	None	Low	Low
Bulletproof-----	Paralithic bedrock	10-14		---	Weakly cemented	None	Low	Low
Fanhill-----	Paralithic bedrock	14-20		---	Weakly cemented	None	Low	Low
Whiterobe-----	Paralithic bedrock	20-39		---	Moderately cemented	None	Low	Low
Rock outcrop.								
Ironlung, rubbly-----	Paralithic bedrock	4-14		---	Weakly cemented	None	Low	Low
Ironped, cool-----	Paralithic bedrock	2-14		---	Weakly cemented	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion		
	Kind	Depth	Thickness			Hardness	Uncoated steel	Concrete
		In	to top	In				
1255: Carrizo, occasionally flooded-----	---	---	---	---	---	None	Low	Low
Rubylee, very rarely flooded-----	---	---	---	---	---	None	Low	Low
1260: Whiterobe-----	Paralithic bedrock	20-39	---	---	Weakly cemented	None	Low	Low
Bigbernie-----	Paralithic bedrock	20-39	---	---	Weakly cemented	None	Low	Low
Whiterobe, cool-----	Paralithic bedrock	20-39	---	---	Weakly cemented	None	Low	Low
Rock outcrop.								
Bigbernie, strongly sloping-----	Paralithic bedrock	20-39	---	---	Weakly cemented	None	Low	Low
Carrizo, occasionally flooded-----	---	---	---	---	---	None	Low	Low
1410: Missionwell-----	Lithic bedrock	3-14	---	---	Indurated	None	Low	Low
Rock outcrop.								
Missionwell, high elevation-----	Lithic bedrock	3-14	---	---	Indurated	None	Low	Low
Typic Haplocalcids, volcanic-----	Lithic bedrock	20-24	---	---	Indurated	None	Low	Low
Missionwell, strongly alkaline-----	Lithic bedrock	3-10	---	---	Indurated	None	Low	Low
Dalelake, thick sandy surface-----	---	---	---	---	---	None	Low	Low
1415: Bolero-----	Lithic bedrock	14-20	---	---	Very strongly cemented	None	Low	Low
Rock outcrop.								
Goldenhills, dry-----	Lithic bedrock	39-59	---	---	Indurated	None	Low	Low
Ironlung-----	Paralithic bedrock	4-14	---	---	Weakly cemented	None	Low	Low
Supplymine, dry-----	Lithic bedrock	20-39	---	---	Very strongly cemented	None	Low	Low

Table 23.--Soil Features--Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
1415: Carrizo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
1504: Rizzo, rarely flooded, stony-----	---	---	---	---	None	Low	Low
Rizzo, occasionally flooded, stony----	---	---	---	---	None	Low	Low
Rockhound, cobbly-----	---	---	---	---	None	Low	Low
Rizzo, frequently flooded, rubbly----	---	---	---	---	None	Low	Low
1510: Carrizo, very gravelly sandy loam----	---	---	---	---	None	Low	Low
Oldale-----	---	---	---	---	None	Low	Moderate
Carrizo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
Pintobasin, overblown-----	---	---	---	---	None	Low	Moderate
1511: Carrizo, channeled-----	---	---	---	---	None	Low	Low
Carrizo, occasionally flooded-----	---	---	---	---	None	Low	Low
Carrizo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
1512: Carrizo, extremely gravelly sandy loam	---	---	---	---	None	Low	Low
Carrizo, rarely flooded-----	---	---	---	---	None	Low	Low
Carrizo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
Carrizo, channeled-----	---	---	---	---	None	Low	Low
Carrizo, occasionally flooded-----	---	---	---	---	None	Low	Low
Oldale-----	---	---	---	---	None	Low	Moderate

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
1513: Carrizo-----	---	In ---	In ---	---	None	Low	Low
Carrizo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
Rubylee-----	---	---	---	---	None	Low	Low
Oldale-----	---	---	---	---	None	Low	Moderate
1514: Carrizo, rarely flooded-----	---	---	---	---	None	Low	Low
Pintobasin, fine sandy loam-----	---	---	---	---	None	Low	Moderate
Rubylee-----	---	---	---	---	None	Low	Low
Carrizo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
Oldale-----	---	---	---	---	None	Low	Moderate
1515: Pintobasin-----	---	---	---	---	None	Low	Moderate
Carrizo, occasionally flooded-----	---	---	---	---	None	Low	Low
Carrizo, frequently flooded-----	---	---	---	---	None	Low	Low
Duric Petroargids-----	Duripan	39-59	---	Moderately cemented	None	Low	Low
Rock outcrop.							
1516: Pintobasin, fine sandy loam-----	---	---	---	---	None	Low	Moderate
Pintobasin, rarely flooded-----	---	---	---	---	None	Low	Moderate
Dalelake-----	---	---	---	---	None	Low	Low
1517: Pintobasin-----	---	---	---	---	None	Low	Moderate
Dalelake-----	---	---	---	---	None	Low	Low
Pintobasin, occasionally flooded, broad-----	---	---	---	---	None	Low	Moderate

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
1517: Pintobasin, rarely flooded-----	---	---	---	---	None	Low	Moderate
Carpetflat-----	Duripan	7-14	---	Very strongly cemented	None	Low	Low
Perurose-----	Duripan	20-39	4-30	Moderately cemented	None	Low	Low
1520: Pintobasin, loamy sand-----	---	---	---	---	None	Low	Low
Carrizo, rarely flooded-----	---	---	---	---	None	Low	Low
Joetree-----	---	---	---	---	None	Low	Low
Pintobasin, rarely flooded, channeled-----	---	---	---	---	None	Low	Moderate
Pintobasin, frequently flooded-----	---	---	---	---	None	Low	Moderate
Rock outcrop.							
1522: Pintobasin, rarely flooded-----	---	---	---	---	None	Low	Moderate
Pintobasin-----	---	---	---	---	None	Low	Moderate
Dalelake-----	---	---	---	---	None	Low	Low
Pintobasin, occasionally flooded-----	---	---	---	---	None	Low	Moderate
Pintobasin, frequently flooded-----	---	---	---	---	None	Low	Moderate
Dalelake, thick sandy surface-----	---	---	---	---	None	Low	Low
Rubylee-----	---	---	---	---	None	Low	Low
1523: Pintobasin, rarely flooded-----	---	---	---	---	None	Low	Moderate
Aquapeak-----	Duripan	5-14	4-24	Weakly cemented	None	Moderate	Low
Pintobasin, occasionally flooded-----	---	---	---	---	None	Low	Moderate
Rubylee, rarely flooded-----	---	---	---	---	None	Low	Low

Table 23.-Soil Features--Continued

Map unit symbol and soil name	Kind	Restrictive layer			Hardness	Potential for frost action	Risk of corrosion	
		Depth to top	Thickness				Uncoated steel	Concrete
			In	In				
1524: Pintobasin, rarely flooded-----	---	---	---	---	---	---	---	---
Pintobasin, occasionally flooded, broad-----	---	---	---	---	---	None	Low	Moderate
Dalelake-----	---	---	---	---	---	None	Low	Moderate
Pintobasin, frequently flooded-----	---	---	---	---	---	None	Low	Low
Carrizo, occasionally flooded-----	---	---	---	---	---	None	Low	Moderate
1525: Pintobasin, occasionally flooded-----	---	---	---	---	---	None	Low	Low
Pintobasin, rarely flooded-----	---	---	---	---	---	None	Low	Moderate
Pintobasin-----	---	---	---	---	---	None	Low	Low
Carrizo, frequently flooded-----	---	---	---	---	---	None	Low	Moderate
Rubylee, rarely flooded-----	---	---	---	---	---	None	Low	Low
1526: Pintobasin, rarely flooded-----	---	---	---	---	---	None	Low	Low
Joetree-----	---	---	---	---	---	None	Low	Moderate
Patscamp-----	---	---	---	---	---	None	Low	Low
Pintobasin, rarely flooded, channeled-	---	---	---	---	---	None	Low	Low
Summill-----	---	---	---	---	---	None	Low	Moderate
Dalelake-----	---	---	---	---	---	None	Low	Low
Pintobasin, frequently flooded-----	---	---	---	---	---	None	Low	Low
1527: Pintobasin, moist-----	---	---	---	---	---	None	Low	Moderate
Pintobasin, occasionally flooded, gravelly surface-----	---	---	---	---	---	None	Low	Low
Carrizo, frequently flooded-----	---	---	---	---	---	None	Low	Moderate
	---	---	---	---	---	None	Low	Low



Table 23.-Soil Features-Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action		Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	In	In	Uncoated steel	Concrete
1530: Dalelake, fine sand-----	---	---	---	---	---	---	Low	Low
Pintobasin, occasionally flooded-----	---	---	---	---	---	---	Low	Moderate
Pintobasin-----	---	---	---	---	---	---	Low	Moderate
Typic Torriorthents-----	---	---	---	---	---	---	Low	Moderate
1531: Dalelake-----	---	---	---	---	---	---	Low	Low
Pintobasin, rarely flooded-----	---	---	---	---	---	---	Low	Moderate
Joetree, overblown-----	---	---	---	---	---	---	Low	Low
Pintobasin, frequently flooded-----	---	---	---	---	---	---	Low	Moderate
Rubylee, rarely flooded-----	---	---	---	---	---	---	Low	Low
1540: Carrizo, very rarely flooded-----	---	---	---	---	---	---	Low	Low
Carrizo, stable-----	---	---	---	---	---	---	Low	Low
Carrizo, occasionally flooded, rocky surface-----	---	---	---	---	---	---	Low	Low
Russiroks-----	---	---	---	---	---	---	Low	Low
1541: Carrizo, stable-----	---	---	---	---	---	---	Low	Low
Cambidic Haplodurids-----	Duripan	16-20	---	Moderately cemented	---	---	Low	Low
Cambidic Haplodurids, sandy surface---	Duripan	16-20	---	Moderately cemented	---	---	Low	Low
Deprave-----	Duripan	20-39	---	Very weakly cemented	---	---	Low	Low
Cambidic Haplodurids, rarely flooded---	Duripan	16-20	---	Moderately cemented	---	---	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer		Potential for frost action	Risk of corrosion	
		Depth to top	Thickness		Uncoated steel	Concrete
1542:						
Carrizo, very rarely flooded-----	---	---	---	None	Low	Low
Carrizo, occasionally flooded-----	---	---	---	None	Low	Low
Carrizo, steep-----	---	---	---	None	Low	Low
Carrizo, frequently flooded-----	---	---	---	None	Low	Low
Pintobasin, moist-----	---	---	---	None	Low	Low
1550:						
Buzzardsprings, stable-----	---	---	---	None	Low	Low
Coxpin-----	Duripan	14-20	4-26	None	Low	Low
Dalelake-----	---	---	---	None	Low	Low
Perurose, rarely flooded-----	Duripan	20-39	Moderately cemented	None	Low	Low
Pintobasin, stable-----	---	---	---	None	Low	Low
Missionwell-----	Lithic bedrock	3-10	Indurated	None	Low	Low
1555:						
Goldrose-----	---	---	---	None	Low	Low
Carsitas, very rarely flooded-----	---	---	---	None	Low	Low
Chemwash, rarely flooded-----	---	---	---	None	High	Low
Rizzo, extremely stony-----	---	---	---	None	Low	Low
Chemwash, occasionally flooded-----	---	---	---	None	High	Low
Rock outcrop.						
2003:						
Emptygun-----	---	---	---	None	Moderate	Low
2060:						
Joetree, very rarely flooded-----	---	---	---	None	Low	Low
Dalelake-----	---	---	---	None	Low	Low

Table 23.-Soil Features-Continued

Map unit symbol and soil name	Kind	Restrictive layer		Hardness	Potential for frost action	Risk of corrosion	
		Depth to top	Thickness			Uncoated steel	Concrete
2060:							
Pintobasin, fine sandy loam-----	---	---	---	---	None	Low	Moderate
Patscamp, frequently flooded-----	---	---	---	---	None	Low	Low
Pintobasin, occasionally flooded-----	---	---	---	---	None	Low	Moderate
2065:							
Dalelake-----	---	---	---	---	None	Low	Low
Aquapeak-----	Duripan	5-14	4-24	Weakly cemented	None	Moderate	Moderate
Coxpin-----	Duripan	14-20	4-26	Moderately cemented	None	Low	Low
Perurose, gravelly surface-----	Duripan	20-39	4-33	Moderately cemented	None	Low	Low
Perurose-----	Duripan	20-39	4-30	Moderately cemented	None	Low	Low
Carizzo, frequently flooded-----	---	---	---	---	None	Low	Low
Buzzardsprings, fine sand-----	---	---	---	---	None	Low	Low
Carizzo-----	---	---	---	---	None	Low	Low
Sunmill-----	---	---	---	---	None	Low	Low
2067:							
Aquapeak, overblown-----	Duripan	5-14	4-24	Weakly cemented	None	Low	Low
Buzzardsprings-----	---	---	---	---	None	Low	Low
Dalelake, thick sandy surface-----	---	---	---	---	None	Low	Low
Buzzardsprings, steep-----	---	---	---	---	None	Low	Low
Missionsweet, moist-----	Duripan	14-20	---	Strongly cemented	None	Low	Low
Rainbowsend, dry-----	Duripan	14-20	---	Indurated	None	Low	Low
Typic Torriorthents-----	---	---	---	---	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		In to top					
2068: Aquapeak----- Carpetflat, nongravelly surface----- Pintobasin----- Missionsweet----- Carrizo, occasionally flooded, rocky surface----- Rubylee, nongravelly surface----- Rubylee-----							
	Duripan	5-14	4-24	Weakly cemented	None	Moderate	Low
	Duripan	4-14	---	Very strongly cemented	None	Low	Low
	---	---	---	---	None	Low	Moderate
	Duripan	14-20	---	Strongly cemented	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
2070: Missionsweet----- Carpetflat----- Carrizo, occasionally flooded, rocky surface----- Rubylee----- Carrizo, occasionally flooded, channeled----- 2075: Oldale----- Missionsweet----- Carrizo, occasionally flooded, channeled----- Carpetflat----- Missionsweet, steep----- Rock outcrop.	Duripan	14-20	---	Strongly cemented	None	Low	Low
	Duripan	7-14	---	Very strongly cemented	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Moderate
	Duripan	14-20	---	Strongly cemented	None	Low	Low
	---	---	---	---	None	Low	Low
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
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---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
---	---	---	---	None	Low	Low	
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Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
2076: Oldale-----	---	---	---	---	None	Low	Moderate
Carriizo-----	---	---	---	---	None	Low	Low
Carriizo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
Goldenbell-----	Duripan	10-14	---	Moderately cemented	None	Low	Low
Missionsweet-----	Duripan	14-20	---	Strongly cemented	None	Low	Low
Carriizo, occasionally flooded, rocky surface-----	---	---	---	---	None	Low	Low
Pintobasin, very rarely flooded-----	---	---	---	---	None	Low	Moderate
2077: Oldale-----	---	---	---	---	None	Low	Moderate
Carriizo-----	---	---	---	---	None	Low	Low
Carriizo, very rarely flooded-----	---	---	---	---	None	Low	Low
Carriizo, occasionally flooded, rocky surface-----	---	---	---	---	None	Low	Low
2085: Rainbowsend-----	Duripan	14-20	---	Indurated	None	Low	Low
Goldenbell-----	Duripan	10-14	---	Moderately cemented	None	Low	Low
Blackeagle, cool-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Carriizo, occasionally flooded, channeled-----	---	---	---	---	None	Low	Low
Rock outcrop.							
2090: Deprave-----	Duripan	20-39	---	Very weakly cemented	None	Low	Low
Rockhound-----	---	---	---	---	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer		Potential for frost action	Risk of corrosion	
		Depth to top	Thickness		Uncoated steel	Concrete
2090:						
Rizzo-----	---	---	---	None	Low	Low
Roostertail, stable-----	Duripan	39-59	Strongly cemented	None	Low	Low
Rizzo, frequently flooded-----	---	---	---	None	Low	Low
Rizzo, occasionally flooded, rocky surface-----	---	---	---	None	Low	Low
Deprave, moderately steep-----	Duripan	20-39	Very weakly cemented	None	Low	Low
Kenalduma-----	Duripan	7-20	Weakly cemented	None	Low	Low
2091:						
Deprave-----	Duripan	20-39	Very weakly cemented	None	Low	Low
Roostertail-----	Duripan	39-59	Strongly cemented	None	Low	Low
Snaggletooth-----	---	---	---	None	Low	Low
Typic Torriorthents, frequently flooded-----	---	---	---	None	High	Low
Descent-----	---	---	---	None	Low	Low
2100:						
Perurose-----	Duripan	20-39	4-30 Moderately cemented	None	Low	Low
Coxpin-----	Duripan	14-20	4-26 Moderately cemented	None	Low	Low
Pintobasin, gravelly surface-----	---	---	---	None	Low	Low
Pintobasin, rarely flooded, channeled-	---	---	---	None	Low	Moderate
Rubylee, sandy surface-----	---	---	---	None	Low	Low
Aquapeak, extremely stony-----	Duripan	5-14	4-24 Weakly cemented	None	Moderate	Low
Carpetflat, sandy substratum-----	Duripan	7-14	Moderately cemented	None	Low	Low
Pintobasin, steep-----	---	---	---	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
2101: Perurose, rarely flooded-----	Duripan	20-39	4-30	Moderately cemented	None	Low	Low
Pintobasin, rarely flooded-----	---	---	---	---	None	Low	Moderate
Coxpin-----	Duripan	14-20	4-26	Moderately cemented	None	Low	Low
2110: Descent-----	---	---	---	---	None	Low	Low
Descent, stable-----	---	---	---	---	None	Low	Low
Carrizo, occasionally flooded, rocky surface-----	---	---	---	---	None	Low	Low
2111: Descent, warm-----	---	---	---	---	None	Low	Low
Rubylee, very rarely flooded-----	---	---	---	---	None	Low	Low
Rock outcrop.							
Carrizo, occasionally flooded-----	---	---	---	---	None	Low	Low
2120: Rizzo, rarely flooded-----	---	---	---	---	None	Low	Low
Deprave-----	Duripan	20-39	---	Very weakly cemented	None	Low	Low
Rizzo, frequently flooded-----	---	---	---	---	None	Low	Low
Rizzo, very rarely flooded-----	---	---	---	---	None	Low	Low
2121: Rizzo, rubbly-----	---	---	---	---	None	Low	Low
Rizzo, frequently flooded-----	---	---	---	---	None	Low	Low
2130: Goldenbell-----	Duripan	10-14	---	Moderately cemented	None	Low	Low
Descent-----	---	---	---	---	None	Low	Low

Table 23.-Soil Features-Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
2130: Rizzo, frequently flooded	---	---	---	---	None	Low	Low
Descent, eroded	---	---	---	---	None	Low	Low
2140: Rockhound, cobbly	---	---	---	---	None	Low	Low
Rockhound, rarely flooded	---	---	---	---	None	Low	Low
Rizzo, occasionally flooded, stony	---	---	---	---	None	Low	Low
2402: Rizzo	---	---	---	---	None	Low	Low
Rizzo, frequently flooded	---	---	---	---	None	Low	Low
Deprave	Duripan	20-39	---	Very weakly cemented	None	Low	Low
Carsitas	---	---	---	---	None	Low	Low
Catfishbay	---	---	---	---	None	Moderate	Low
Rock outcrop.							
2403: Rizzo	---	---	---	---	None	Low	Low
Rizzo, occasionally flooded	---	---	---	---	None	Low	Low
Deprave	Duripan	20-39	---	Very weakly cemented	None	Low	Low
Rizzo, moderately steep	---	---	---	---	None	Low	Low
2404: Rizzo, occasionally flooded	---	---	---	---	None	Low	Low
Rizzo, very rarely flooded	---	---	---	---	None	Low	Low
Rizzo, frequently flooded	---	---	---	---	None	Low	Low
Riverwash.							



Table 23.-Soil Features-Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion			
	Kind	Depth to top	Thickness			Hardness	Uncoated steel	Concrete	
			In	In					
2405: Carrizo, rarely flooded-----	---	---	---	---	---	---	---	---	---
Carrizo, occasionally flooded-----	---	---	---	---	---	---	---	None	Low
Oldale-----	---	---	---	---	---	---	---	None	Low
Carrizo, frequently flooded-----	---	---	---	---	---	---	---	None	Low
2406: Pintobasin, frequently flooded-----	---	---	---	---	---	---	---	None	Moderate
Carrizo, occasionally flooded-----	---	---	---	---	---	---	---	None	Low
Pintobasin, rarely flooded-----	---	---	---	---	---	---	---	None	Moderate
2407: Pintobasin, rarely flooded-----	---	---	---	---	---	---	---	None	Moderate
Carrizo, occasionally flooded-----	---	---	---	---	---	---	---	None	Low
Carrizo, frequently flooded-----	---	---	---	---	---	---	---	None	Low
Aquapeak-----	Duripan	5-14	4-24	Weakly cemented	---	---	---	None	Moderate
2408: Rizzo, frequently flooded-----	---	---	---	---	---	---	---	None	Low
Rizzo, very rarely flooded-----	---	---	---	---	---	---	---	None	Low
Rizzo, strongly sloping-----	---	---	---	---	---	---	---	None	Low
Rockhound, overwash-----	---	---	---	---	---	---	---	None	Low
Deprave, overwash-----	Duripan	20-39	---	---	---	---	---	None	Low
Rizzo, gravelly surface-----	---	---	---	---	---	---	---	None	Low
2409: Rizzo, frequently flooded-----	---	---	---	---	---	---	---	None	Low
Chemwash, frequently flooded-----	---	---	---	---	---	---	---	None	High
Carsitas, occasionally flooded, braided-----	---	---	---	---	---	---	---	None	Low

Table 23.-Soil Features-Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
2409: Rizzo, extremely stony-----	---	---	---	---	None	Low	Low
Goldrose-----	---	---	---	---	None	Low	Low
Rock outcrop.							
2420: Carsitas, frequently flooded-----	---	---	---	---	None	Low	Low
Carsitas, occasionally flooded-----	---	---	---	---	None	Low	Low
Carsitas, rarely flooded-----	---	---	---	---	None	Low	Low
2421: Carsitas, very rarely flooded-----	---	---	---	---	None	Low	Low
Carsitas, rarely flooded-----	---	---	---	---	None	Low	Low
Carsitas, occasionally flooded, braided-----	---	---	---	---	None	Low	Low
Rizzo, very rarely flooded-----	---	---	---	---	None	Low	Low
Chemwash, frequently flooded-----	---	---	---	---	None	High	Low
Typic Haplargids, very rarely flooded- Riverwash.	---	---	---	---	None	Low	Low
2431: Chemwash, frequently flooded, braided- Chemwash, frequently flooded-----	---	---	---	---	None	High	Low
Chemwash, rarely flooded-----	---	---	---	---	None	High	Low
Cajon, occasionally flooded----- Riverwash.	---	---	---	---	None	Low	Low
2440: Rizzo-----	---	---	---	---	None	Low	Low
Rizzo, occasionally flooded-----	---	---	---	---	None	Low	Low
Rizzo, extremely stony-----	---	---	---	---	None	Low	Low

Table 23.-Soil Features-Continued

Map unit symbol and soil name	Kind	Restrictive layer		Hardness	Potential for frost action	Risk of corrosion	
		Depth to top	Thickness			Uncoated steel	Concrete
2440: Rizzo, frequently flooded-----	---	---	---	---	None	Low	Low
Rizzo, steep-----	---	---	---	---	None	Low	Low
2715: Dalelake-----	---	---	---	---	None	Low	Low
Sheephole-----	---	---	---	---	None	Low	Low
Pintobasin-----	---	---	---	---	None	Low	Moderate
Dalelake, strongly sloping-----	---	---	---	---	None	Low	Low
Carriazo, frequently flooded-----	---	---	---	---	None	Low	Low
2716: Dalelake, steep-----	---	---	---	---	None	Low	Low
Dalelake-----	---	---	---	---	None	Low	Low
Perurose-----	Duripan	20-39	4-30	Moderately cemented	None	Low	Low
2717: Dalelake-----	---	---	---	---	None	Low	Low
Rock outcrop.							
Buzzardsprings, fine sand-----	---	---	---	---	None	Low	Low
Missionwell-----	Lithic bedrock	3-10	---	Indurated	None	Low	Low
Dalelake, moderately sloping-----	---	---	---	---	None	Low	Low
Impedimenta-----	Lithic bedrock	1-7	---	Very strongly cemented	None	Low	Low
2718: Dalelake-----	---	---	---	---	None	Low	Low
Sheephole, gravelly surface-----	---	---	---	---	None	Low	Low
2820: Rock outcrop.							
Impedimenta-----	Lithic bedrock	1-7	---	Very strongly cemented	None	Low	Low

Table 23.-Soil Features-Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
2820: Marbolite-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Pintobasin, occasionally flooded, narrow-----	---	---	---	---	None	Low	Moderate
Perurose-----	Duripan	20-39	4-30	Moderately cemented	None	Low	Low
2825: Rock outcrop.							
Supplymine-----	Lithic bedrock	20-39	---	Very strongly cemented	None	Low	Low
Bolero, dry-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Ironage-----	Lithic bedrock	20-39	---	Indurated	None	Low	Low
Blackeagle-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Dalelake-----	---	---	---	---	None	Low	Low
2830: Rock outcrop.							
Blackeagle, cool-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Marbolite-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Blackeagle-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Impedimenta-----	Lithic bedrock	1-7	---	Very strongly cemented	None	Low	Low
Supplymine-----	Lithic bedrock	20-39	---	Very strongly cemented	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer		Potential for frost action	Risk of corrosion	
		Depth to top	Thickness		Uncoated steel	Concrete
2835: Rock outcrop.						
Blackeagle-----	Lithic bedrock	14-20	---	None	Low	Low
Supplymine-----	Lithic bedrock	20-39	---	None	Low	Low
Rizzo, extremely stony-----	---	---	---	None	Low	Low
Aguilareal-----	Lithic bedrock	14-20	---	None	Low	Low
Rubble land.						
Rizzo, frequently flooded-----	---	---	---	None	Low	Low
2840: Rock outcrop.						
Jadestorm-----	Paralithic bedrock	4-14	2-7	None	Low	Low
	Lithic bedrock	6-20	---			
Rizzo, extremely stony-----	---	---	---	None	Low	Low
Carrizo, frequently flooded-----	---	---	---	None	Low	Low
3110: Coppermine, cool-----	Lithic bedrock	5-14	---	None	Low	Low
Stranger-----	Lithic bedrock	3-10	---	None	Low	Low
Supplymine-----	Lithic bedrock	20-39	---	None	Low	Low
Rock outcrop.						
Typic Petrocalcids-----	Petrocalcic	8-39	21-31	None	Low	Low
	Lithic bedrock	30-59	---			

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer		Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness	Uncoated steel	Concrete
3110: Grubstake-----	Paralithic bedrock	14-20	3-18	Weakly cemented	Low	Low
	Lithic bedrock	18-37	---	Indurated		
Stranger, frequently flooded-----	Lithic bedrock	3-10	---	Indurated	Low	Low
3120: Aguilareal-----	Lithic bedrock	14-20	---	Very strongly cemented	Low	Low
Blackeagle-----	Lithic bedrock	14-20	---	Very strongly cemented	Low	Low
Rock outcrop.						
Bigbernie, warm-----	Paralithic bedrock	20-39	---	Weakly cemented	Low	Low
Contactmine-----	Paralithic bedrock	20-39	---	Weakly cemented	Low	Low
Pinecity, cool-----	Paralithic bedrock	2-14	---	Weakly cemented	Low	Low
Lithic Haplocalcids-----	Lithic bedrock	12-20	---	Indurated	Low	Low
Typic Haplargids-----	Paralithic bedrock	20-49	---	Moderately cemented	Moderate	Low
3213: Dalvord-----	Lithic bedrock	3-14	---	Very strongly cemented	Low	Low
Aguilareal-----	Lithic bedrock	14-20	---	Very strongly cemented	Low	Low
Rock outcrop.						
Dalvord, bouldery-----	Lithic bedrock	3-14	---	Very strongly cemented	Low	Low
Langwell-----	Lithic bedrock	4-14	---	Very strongly cemented	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
3242: Langwell-----	Lithic bedrock	4-14	---	Very strongly cemented	None	Low	Low
Rock outcrop.							
Helendale, cool-----	---	---	---	---	None	Low	Low
Arizo, rarely flooded-----	---	---	---	---	None	Low	Low
3285: Pinecity-----	Paralithic bedrock	2-7	---	Weakly cemented	None	Low	Low
Contactmine-----	Paralithic bedrock	20-39	---	Weakly cemented	None	Moderate	Low
Desertqueen-----	Paralithic bedrock	11-14	---	Weakly cemented	None	Low	Low
Rock outcrop.							
Littlefargo-----	Paralithic bedrock	20-39	---	Moderately cemented	None	Low	Low
Pinecity, low sloping-----	Paralithic bedrock	2-7	---	Weakly cemented	None	Low	Low
Pinecity, cool-----	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low
3286: Pinecity, gravelly loamy sand-----	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low
Rock outcrop.							
Desertqueen-----	Paralithic bedrock	9-14	---	Weakly cemented	None	Low	Low
Pinecity, steep, high elevation-----	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
3291: Smithcanyon-----	Paralithic bedrock	In	In				
		3-14	---	Moderately cemented	None	Low	Low
		7-14	---	Moderately cemented	None	Low	Low
Rock outcrop.							
Smithcanyon, moderately sloping-----	Paralithic bedrock	3-14	---	Moderately cemented	None	Low	Low
		20-39	---	Weakly cemented	None	Low	Low
		4-14	---	Weakly cemented	None	Low	Low
Pinecity-----	Paralithic bedrock	3-14	---	Moderately cemented	None	Low	Moderate
		2-14	---	Extremely weakly cemented	None	Low	Low
3292: Smithcanyon-----	Paralithic bedrock						
Pinecity-----	Paralithic bedrock	2-14	---	Extremely weakly cemented	None	Low	Low
Rock outcrop.							
Lostpalms-----	Lithic bedrock	2-14	---	Very strongly cemented	None	Low	Low
Thunderclap, rarely flooded-----	Paralithic bedrock	59-79	---	Very weakly cemented	None	Low	Low
Pinecity, very steep-----	Paralithic bedrock	2-14	---	Extremely weakly cemented	None	Low	Low
Smithcanyon, strongly sloping-----	Paralithic bedrock	2-14	---	Moderately cemented	None	Low	Moderate
Smithcanyon, very steep-----	Paralithic bedrock	3-14	---	Weakly cemented	None	Low	Moderate
3293: Smithcanyon-----	Paralithic bedrock						
Pinecity-----	Paralithic bedrock	3-14	---	Moderately cemented	None	Low	Low



Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In —	In —				
3293: Pinecity, strongly sloping-----  Rock outcrop.	Paralithic bedrock	2-14	---	Extremely weakly cemented	None	Low	Low
Pinecity, very steep-----  Smithcanyon, dry-----	Paralithic bedrock	2-14	---	Extremely weakly cemented	None	Low	Low
Smithcanyon, mesic-----  Thunderclap, rarely flooded-----	Paralithic bedrock	3-14	---	Weakly cemented	Low	Low	Low
3294: Smithcanyon, dry-----  Smithcanyon, dry, moderately steep-----  Rock outcrop.	Paralithic bedrock	3-14	---	Weakly cemented	None	Low	Low
Xeric Torriorthents, dry-----  Arizo, rarely flooded-----	Paralithic bedrock	20-59	---	Weakly cemented	None	Low	Low
3295: Desertqueen, dry-----  Hexie-----  Rock outcrop.	Paralithic bedrock	5-14	---	Moderately cemented	None	Low	Low
Helendale-----  Contactmine, warm-----	Paralithic bedrock	20-39	---	Weakly cemented	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer		Potential for frost action	Risk of corrosion	
		Depth to top	Thickness		Uncoated steel	Concrete
3295: Contactmine, dry-----	Paralithic bedrock	In	In	None	Moderate	Low
		20-39	---			
Pinecity-----	Paralithic bedrock	2-8	---	None	Low	Low
3296: Desertqueen-----	Paralithic bedrock	8-14	---	None	Low	Moderate
Pinecity-----	Paralithic bedrock	2-8	---	None	Low	Low
Smithcanyon-----	Paralithic bedrock	2-14	---	None	Low	Low
Rock outcrop.						
Desertqueen, low slope-----	Paralithic bedrock	8-14	---	None	Low	Moderate
Pinecity, cool-----	Paralithic bedrock	2-8	---	None	Low	Low
Littlefargo-----	Paralithic bedrock	20-39	---	None	Low	Low
3297: Desertqueen, warm-----	Paralithic bedrock	4-14	---	None	Low	Low
Contactmine, dry-----	Paralithic bedrock	47-49	---	None	Low	Low
Seanna, dry-----	Paralithic bedrock	4-17	---	None	Low	Low
Rock outcrop.						
Arizo, rarely flooded-----	---	---	---	None	Low	Low
Arizo, occasionally flooded-----	---	---	---	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion		
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete	
		In —	In —					
3325: Ironped, warm-----  Rock outcrop.	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low	
Hexie-----  Ironped-----	Paralithic bedrock	20-39	---	Moderately cemented	None	Low	Low	
Pinecity, cool-----	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low	
Aguilareal-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low	
Desertqueen-----	Paralithic bedrock	9-14	---	Weakly cemented	None	Low	Moderate	
Ironped, warm, moderately steep-----  Morongo, occasionally flooded-----	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low	
Smithcanyon-----	Paralithic bedrock	3-14	---	Moderately cemented	None	Low	Low	
3335: Xeric Torriorthents-----  Rock outcrop.	Paralithic bedrock	20-59	---	Weakly cemented	None	Low	Low	
Xeric Torriorthents, warm-----	Paralithic bedrock	20-59	---	Weakly cemented	None	Low	Low	
Smithcanyon, dry-----	Paralithic bedrock	3-14	---	Weakly cemented	None	Low	Low	
3336: Xeric Torriorthents-----  Bigbernie-----	Paralithic bedrock	20-59	---	Weakly cemented	None	Low	Low	

Table 23.--Soil Features--Continued

Map unit symbol and soil name	Kind	Restrictive layer		Potential for frost action	Risk of corrosion	
		Depth to top	Thickness		Uncoated steel	Concrete
3336: Goldenhills, warm----- Rock outcrop. Chutes.	Lithic bedrock	39-59	---	Indurated	None	Low
Pinecity, warm----- Arizo, rarely flooded----- Pinecity----- Smithcanyon, dry-----	Paralithic bedrock --- Paralithic bedrock Paralithic bedrock	2-14 --- 2-14 3-14	--- --- --- ---	Extremely weakly cemented --- Extremely weakly cemented Weakly cemented	None None None None	Low Low Low Low
3340: Seanna----- Grubstake, moist----- Pinecity----- Rock outcrop.	Paralithic bedrock Paralithic bedrock Lithic bedrock Paralithic bedrock	4-17 14-20 18-37 8-14	--- 3-18 --- 45-51	Weakly cemented Weakly cemented Indurated Moderately cemented	None None None None	Low Low Low Low
Seanna, non-rocky----- Contactmine, dry----- Hexie----- Seanna, warm----- Cajon, rarely flooded----- Seanna, cool-----	Paralithic bedrock Paralithic bedrock Paralithic bedrock --- Paralithic bedrock	4-17 25-38 20-39 4-17 --- 4-17	--- --- --- --- --- ---	Weakly cemented Moderately cemented Moderately cemented Weakly cemented --- Weakly cemented	None None None None None None	Low Low Low Low Low Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion		
	Kind	Depth to top	Thickness			Hardness	Uncoated steel	Concrete
		In	In	In				
3345: Bigcanyon-----	Paralithic bedrock	20-39	---	---	None	Low	Low	
			Very weakly cemented					
	Paralithic bedrock	20-39	---	---	None	Low	Low	
			Weakly cemented					
Ironped-----	Paralithic bedrock	2-14	---	---	None	Low	Low	
			Weakly cemented					
Smithcanyon, dry-----	Paralithic bedrock	3-14	---	---	None	Low	Low	
			Weakly cemented					
Whiterobe, cool-----	Paralithic bedrock	20-39	---	---	None	Low	Low	
			Weakly cemented					
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low	
			---					
Rock outcrop.								
Arizo, very rarely flooded-----	---	---	---	---	None	Low	Low	
			---					
	Lithic bedrock	14-20	---	---	None	Low	Low	
			Indurated					
3440: Pacific Mesa, steep-----	Lithic bedrock	14-20	---	---	None	Low	Low	
			Indurated					
	Lithic bedrock	14-20	---	---	None	Low	Low	
			Indurated					
Marsite-----	Duripan Lithic bedrock	5-14 6-20	1-6	Strongly cemented	None	Low	Low	
			---	Indurated				
3509: Cajon, very rarely flooded-----	---	---	---	---	None	Low	Low	
			---					
	---	---	---	---	None	Low	Low	
			---					
Friedliver-----	Petrocalcic	20-38	4-45	Moderately cemented	None	Low	Low	
			---					
Cajon-----	---	---	---	---	None	Low	Low	
			---					
Cajon, rarely flooded-----	---	---	---	---	None	Low	Low	
			---					
Olympus, rarely flooded-----	---	---	---	---	None	Low	Low	
			---					
Cajon, frequently flooded-----	---	---	---	---	None	Low	Low	
			---					

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
3525: Cajon-----	---	---	---	---	None	Low	Low
Friedliver-----	---	---	---	---	None	Low	Low
Burntshack-----	---	---	---	---	None	Low	Low
Silvermine-----	Duripan	1-7	---	Weakly cemented	None	Low	Low
Blackmagic-----	---	---	---	---	None	Low	Low
Silvermine, stable-----	Duripan	1-7	---	Weakly cemented	None	Low	Low
Rock outcrop.							
3526: Cajon-----	---	---	---	---	None	Low	Low
Hypoint-----	---	---	---	---	None	Low	Low
Arizo, occasionally flooded-----	---	---	---	---	None	Low	Low
Arizo, frequently flooded-----	---	---	---	---	None	Low	Low
Helendale-----	---	---	---	---	None	Low	Low
3611: Burntshack, sand surface-----	---	---	---	---	None	Low	Low
Burntshack-----	---	---	---	---	None	Low	Low
Morongo, very rarely flooded-----	---	---	---	---	None	Low	Low
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low
Rock outcrop.							
3612: Burntshack-----	---	---	---	---	None	Low	Low
Burntshack, occasionally flooded-----	---	---	---	---	None	Low	Low
Arizo, occasionally flooded-----	---	---	---	---	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
3676: Morongo, loamy sand, very rarely flooded-----	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
3677: Morongo-----	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
3679: Morongo, cool-----	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
3680: Morongo-----	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
	---	---	---	---	None	Low	Low
Helendale, very rarely flooded-----	---	---	---	---	None	Moderate	Low
	---	---	---	---	None	Moderate	Low
	---	---	---	---	None	Moderate	Low
	---	---	---	---	None	Moderate	Low
	---	---	---	---	None	Moderate	Low

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Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer		Hardness	Potential for frost action	Risk of corrosion	
		Depth to top	Thickness			Uncoated steel	Concrete
3683: Cronese, very rarely flooded-----	---	---	---	---	None	Low	Low
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low
Morongo, frequently flooded-----	---	---	---	---	None	Low	Low
3684: Morongo, warm-----	---	---	---	---	None	Low	Low
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low
Nasagold, warm-----	---	---	---	---	None	Low	Low
Pinecity, moist-----	Paralithic bedrock	2-8	---	Weakly cemented	None	Low	Low
3685: Morongo, cool-----	---	---	---	---	None	Low	Low
Desertqueen, undulating-----	Paralithic bedrock	8-14	---	Weakly cemented	None	Low	Low
Morongo, very rarely flooded-----	---	---	---	---	None	Low	Low
Jumborox-----	---	---	---	---	None	Low	Low
Urban land.							
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low
Pinecity-----	Paralithic bedrock	2-14	---	Extremely weakly cemented	None	Low	Low
3690: Nasagold-----	---	---	---	---	None	Low	Low
Jumborox, warm-----	---	---	---	---	None	Low	Low
Yander-----	Paralithic bedrock	39-59	---	Moderately cemented	None	Low	Moderate
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low
Morongo, frequently flooded-----	---	---	---	---	None	Low	Low

Table 23.-Soil Features-Continued

Map unit symbol and soil name	Restrictive layer					Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness		Hardness		Uncoated steel	Concrete
			In	In				
3695: Gocougs-----	Petrocalcic	20-39	4-32		Moderately cemented	None	Low	Low
Popups, very rarely flooded-----	Duripan	20-39	20-39		Weakly cemented	None	Low	Low
Jetmine, very rarely flooded-----	Duripan	14-20	---		Weakly cemented	None	Low	Low
Rock outcrop.								
4031: Crosgrain-----	Duripan	6-14	---		Indurated	None	Low	Low
Crackerjack-----	Duripan	10-14	---		Weakly cemented	None	Low	Low
Pinkcan, dry-----	Duripan	39-59	---		Moderately cemented	None	Low	Low
Crosgrain, steep-----	Duripan	6-14	---		Indurated	None	Low	Low
4041: Silvermine-----	Duripan	6-14	---		Weakly cemented	None	Low	Low
Helendale-----	---	---	---		---	None	Low	Low
Burntshack, very rarely flooded-----	---	---	---		---	None	Low	Low
Cajon-----	---	---	---		---	None	Low	Low
Arizo, occasionally flooded-----	---	---	---		---	None	Low	Low
4064: Gravesumit-----	---	---	---		---	None	Low	Low
Helendale, sandy surface-----	---	---	---		---	None	Low	Low
Cajon, occasionally flooded-----	---	---	---		---	None	Low	Low
Gocougs-----	Petrocalcic	20-39	4-32		Moderately cemented	None	Low	Low
Cajon-----	---	---	---		---	None	Low	Low
Hypoint-----	---	---	---		---	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer					Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness	Uncoated steel		Concrete	
		In to top						In ---
4071: Helendale-----	---	---	---	---	None	Low	Low	
Desertqueen, very rarely flooded-----	Paralithic bedrock	8-14	---	Moderately cemented	None	Low	Moderate	
Rock outcrop.								
Morongo, occasionally flooded-----	---	---	---	---	None	Low	Low	
Pinecity-----	Paralithic bedrock	2-10	---	Moderately cemented	None	Low	Low	
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low	
4091: Littlefargo-----	Paralithic bedrock	20-39	---	Moderately cemented	None	Low	Low	
Rock outcrop.								
Pinecity-----	Paralithic bedrock	2-10	---	Moderately cemented	None	Low	Low	
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low	
4245: Bluecut-----	---	---	---	---	None	Low	Low	
Morongo, very rarely flooded-----	---	---	---	---	None	Low	Low	
Yander, very rarely flooded-----	Paralithic bedrock	39-59	---	Moderately cemented	None	Low	Low	
Yander, warm, very rarely flooded-----	Paralithic bedrock	39-59	---	Moderately cemented	None	Low	Low	
Jumborox, warm-----	---	---	---	---	None	Low	Low	
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low	
Morongo, frequently flooded-----	---	---	---	---	None	Low	Low	
4260: Minhoyt-----	Duripan	1-3	---	Moderately cemented	None	Low	Low	
		4-9		Strongly cemented				
		10-28		Very strongly cemented				

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
4260: Corbilt, rarely flooded-----	Duripan	39-61	2-24	Moderately cemented	None	Low	Low
Popups, cool-----	Duripan	20-39	20-39	Moderately cemented	None	Low	Low
Minhoyt, sloping-----	Duripan	1-3	---	Moderately cemented	None	Low	Low
Riverwash.		4-9	---	Strongly cemented			
4265: Werewolf, warm-----	---	---	---	Very strongly cemented			
Werewolf-----	---	---	---		None	Low	Low
Werewolf, warm, gently sloping-----	---	---	---		None	Low	Low
Arizo, occasionally flooded-----	---	---	---		None	Low	Low
Arizo, rarely flooded-----	---	---	---		None	Low	Low
4270: Yuccabutte, extremely cobbly sandy loam-----	---	---	---				
Cajon, occasionally flooded-----	---	---	---		None	Low	Low
4271: Yuccabutte, warm-----	---	---	---		None	Low	Low
Arizo, rarely flooded-----	---	---	---		None	Low	Low
Rock outcrop.							
Cajon, occasionally flooded-----	---	---	---		None	Low	Low
Yuccabutte, steep-----	---	---	---		None	Low	Low
4275: Pinkcan-----	Duripan	39-59	---	Weakly cemented	None	Low	Low
Werewolf-----	---	---	---		None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		In to top					
4275: Gocougs, warm-----	Petrocalcic	20-39	4-32	Moderately cemented	None	Moderate	Low
Arizo, rarely flooded-----	---	---	---	---	None	Low	Low
Yuccabutte, dry-----	---	---	---	---	None	Low	Low
Gocougs, stable-----	Petrocalcic	20-39	4-32	Moderately cemented	None	Low	Low
Joshua-----	Duripan	20-39	---	Moderately cemented	None	High	High
Gravesunit-----	---	---	---	---	None	Low	Low
4280: Mekkadale-----	Duripan	14-20	5-15	Weakly cemented	None	Low	Low
Edalph, warm-----	---	---	---	---	None	Low	Low
Edalph-----	---	---	---	---	None	Low	Low
Cajon, rarely flooded-----	---	---	---	---	None	Low	Low
Gocougs-----	Petrocalcic	20-39	4-32	Moderately cemented	None	Low	Low
4285: Typic Argidurids-----	Duripan	25	---	Indurated	None	Low	Low
Coppermine-----	Lithic bedrock	5-14	---	Very strongly cemented	None	Low	Low
Minhoyt, warm-----	Duripan	1-7	---	Very strongly cemented	None	Low	Low
Rock outcrop.							
Typic Argidurids, steep-----	Duripan	25	---	Indurated	None	Low	Low
Arizo, occasionally flooded-----	---	---	---	---	None	Low	Low
4403: Arizo, rarely flooded, channelled-----	---	---	---	---	None	Low	Low
Arizo, rarely flooded-----	---	---	---	---	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer		Hardness	Potential for frost action	Risk of corrosion	
		Depth to top	Thickness			Uncoated steel	Concrete
4403: Arizo-----	---	---	---	---	None	Low	Low
Werewolf, stable-----	---	---	---	---	None	Low	Low
4440: Dragonwash, occasionally flooded-----	---	---	---	---	None	Low	Low
Dragonwash, frequently flooded-----	---	---	---	---	None	High	Low
Cajon, rarely flooded-----	---	---	---	---	None	Low	Low
Riverwash.							
4450: Morongo, occasionally flooded-----	---	---	---	---	None	Low	Low
Morongo, frequently flooded-----	---	---	---	---	None	Low	Low
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low
Morongo, very rarely flooded-----	---	---	---	---	None	Low	Moderate
Riverwash.							
4605: Pinicity, moist-----	Paralithic bedrock	2-8	---	Weakly cemented	None	Low	Low
Rock outcrop.							
Nasagold-----	---	---	---	---	None	Low	Low
Jumborox, dry-----	---	---	---	---	None	Low	Low
Morongo, very rarely flooded-----	---	---	---	---	None	Low	Low
Morongo, occasionally flooded-----	---	---	---	---	None	Low	Low
4606: Pinicity-----	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low
Rock outcrop.							
Desertqueen, cool-----	Paralithic bedrock	9-14	---	Weakly cemented	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
4606: Jumborox, warm-----	---	---	---	---	None	Low	Low
Morongo, very rarely flooded-----	---	---	---	---	None	Low	Low
4607: Pinicity-----	Paralithic bedrock	2-8	49-57	Weakly cemented	None	Low	Low
Morongo, very rarely flooded-----	---	---	---	---	None	Low	Moderate
Pinicity, sloping-----	Paralithic bedrock	2-8	49-57	Weakly cemented	None	Low	Low
Rock outcrop.							
4608: Pinicity-----	Paralithic bedrock	2-10	---	Moderately cemented	None	Low	Low
Rock outcrop.							
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low
4610: Desertqueen-----	Paralithic bedrock	9-14	---	Weakly cemented	None	Low	Moderate
Jumborox, warm-----	---	---	---	---	None	Low	Low
Rock outcrop.							
Pinicity, cool-----	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low
Pinicity, moist-----	Paralithic bedrock	4-14	---	Weakly cemented	None	Low	Low
Littlefargo-----	Paralithic bedrock	20-39	---	Moderately cemented	None	Low	Low
Morongo, occasionally flooded-----	---	---	---	---	None	Low	Low
Morongo, rarely flooded-----	---	---	---	---	None	Low	Low
Ambrosia, cool-----	---	---	---	---	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth	Thickness	Hardness		Uncoated steel	Concrete
		In to top	In				
4615: Desertqueen, cool-----	Paralithic bedrock	8-14	---	Moderately cemented	None	Low	Low
Jumborox-----	---	---	---	---	None	Low	Low
Rock outcrop.							
Desertqueen, steep-----	Paralithic bedrock	8-14	---	Moderately cemented	None	Low	Low
Morongo, occasionally flooded-----	---	---	---	---	None	Low	Low
Pinecity-----	Paralithic bedrock	2-10	49-57	Moderately cemented	None	Low	Low
4620: Stranger-----	Lithic bedrock	3-10	---	Indurated	None	Low	Low
Rock outcrop.							
Grubstake, moist-----	Paralithic bedrock	14-20	3-18	Weakly cemented	None	Low	Low
	Lithic bedrock	18-37	---	Indurated			
Cajon, occasionally flooded-----	---	---	---	---	None	Low	Low
4625: Grinder-----	Lithic bedrock	8-14	---	Very strongly cemented	None	Low	Low
Grinder, cool-----	Lithic bedrock	8-14	---	Very strongly cemented	None	Low	Low
Pinkcan, cool-----	Duripan	39-59	---	Moderately cemented	None	Low	Low
Rock outcrop.							
Arizo, rarely flooded-----	---	---	---	---	None	Low	Low
Cajon, frequently flooded-----	---	---	---	---	None	Low	Low
4630: Thunderclap-----	Paralithic bedrock	59-79	---	Moderately cemented	None	Low	Low



Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer		Potential for frost action	Risk of corrosion	
		Depth to top	Thickness		Uncoated steel	Concrete
		In	In			
4630: Smithcanyon-----	Paralithic bedrock	2-14	---	None	Low	Low
Smithcanyon, moderately steep-----	Paralithic bedrock	2-14	---	None	Low	Moderate
Rock outcrop.						
Stubbespring-----	Paralithic bedrock	7-14	---	None	Low	Low
Thunderclap, rarely flooded-----	Paralithic bedrock	59-79	---	None	Low	Low
4804: Rock outcrop.						
Ironped-----	Paralithic bedrock	2-14	---	None	Low	Low
Pinecity-----	Paralithic bedrock	2-14	---	None	Low	Low
Littlefargo-----	Paralithic bedrock	20-39	---	None	Low	Low
Arizo, occasionally flooded-----	---	---	---	None	Low	Low
Pinecity, cool-----	Paralithic bedrock	2-14	---	None	Low	Low
4805: Rock outcrop.						
Ironped, cool-----	Paralithic bedrock	2-14	45-57	None	Low	Low
Lostpalms, cool-----	Lithic bedrock	2-14	---	None	Low	Low
Morongo, warm-----	---	---	---	None	Low	Low
Morongo, frequently flooded-----	---	---	---	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
4806: Rock outcrop.							
Pinecity, cool-----	Paralithic bedrock	2-14	---	Weakly cemented	Low	Low	Low
Pinecity, gravelly loamy sand-----	Paralithic bedrock	2-14	---	Weakly cemented	None	Low	Low
4811: Rock outcrop.							
Pioneertown-----	Lithic bedrock	2-14	---	Very strongly cemented	Low	Low	Low
Dalvord, cool-----	Lithic bedrock	1-14	---	Very strongly cemented	None	Low	Low
4825: Rock outcrop.							
Grubstake-----	Paralithic bedrock	14-20	3-18	Weakly cemented	None	Low	Low
Cajon, rarely flooded-----	Lithic bedrock	18-37	---	Indurated			
Stranger, warm-----	---	---	---	---	None	Low	Low
Ironped-----	Lithic bedrock	3-10	---	Indurated	None	Low	Low
Lostpalms-----	Paralithic bedrock	10-16	45-57	Extremely weakly cemented	None	Low	Low
Grinder, warm-----	Lithic bedrock	2-14	---	Very strongly cemented	None	Low	Low
4830: Rock outcrop.							
Pinecity, cool-----	Paralithic bedrock	2-14	45-57	Weakly cemented	None	Low	Low
Blackeagle-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low

Table 23.—Soil Features—Continued

Map unit symbol and soil name	Kind	Restrictive layer			Potential for frost action	Risk of corrosion	
		Depth to top	Thickness	Hardness		Uncoated steel	Concrete
4830: Stranger-----  Grubstake, moist-----	Lithic bedrock	3-10	---	Indurated	None	Low	Low
	Paralithic bedrock	14-20	3-18	Weakly cemented	None	Low	Low
	Lithic bedrock	18-37	---	Indurated			
4900: Rock outcrop.							
Aguilareal-----	Lithic bedrock	14-20	---	Very strongly cemented	None	Low	Low
Lostpalms-----	Lithic bedrock	2-14	---	Very strongly cemented	None	Low	Low
Lostpalms, warm-----	Lithic bedrock	2-14	---	Very strongly cemented	None	Low	Low
Dalvord-----	Lithic bedrock	2-14	---	Very strongly cemented	None	Low	Low

Table 24.-Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency		
1220: Jadestorm-----	D	--	--	--	--	--	--	--	--	--	
Blackeagle, cool-----	D	--	--	--	--	--	--	--	--	--	
Rock outcrop.											
1225: Blackeagle-----	D	Jan-Dec	--	--	--	--	None	--		None	
Rock outcrop.											
1230: Jadestorm-----	D	--	--	--	--	--	--	--	--	--	
Jadestorm, cool-----	D	--	--	--	--	--	--	--	--	--	
Rock outcrop.											
1240: Meccapass-----	A	--	--	--	--	--	--	--	--	--	
Bulletproof-----	D	--	--	--	--	--	--	--	--	--	
Rock outcrop.											
1241: Meccapass-----	A	--	--	--	--	--	--	--	--	--	
Seanna-----	D	--	--	--	--	--	--	--	--	--	
Contactmine, dry-----	C	--	--	--	--	--	--	--	--	--	

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency	Duration	Frequency
1242: Meccapass-----	A	---	---	---	---	---	---	---	---	---	---
Jadestorm-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1250: Ironlung-----	D	---	---	---	---	---	---	---	---	---	---
Ironlung, cool-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1255: Goldenhills-----	A	---	---	---	---	---	---	---	---	---	---
Bulletproof-----	D	---	---	---	---	---	---	---	---	---	---
Fanhill-----	D	---	---	---	---	---	---	---	---	---	---
Whiterobe-----	A	---	---	---	---	---	---	---	---	---	---
1260: Whiterobe-----	A	---	---	---	---	---	---	---	---	---	---
Bigbernie-----	A	---	---	---	---	---	---	---	---	---	---
Whiterobe, cool-----	A	---	---	---	---	---	---	---	---	---	---
1410: Missionwell-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency		
1410: Missionwell, high elevation-----	D	---	---	---	---	---	---	---	---	---	
1415: Bolero-----	D	---	---	---	---	---	---	---	---	---	
Rock outcrop.											
1504: Rizzo, rarely flooded, stony-----	A	January February March July August September October December	---	---	---	---	---	---	Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief	Rare Rare Rare Rare Rare Rare Rare	
Rizzo, occasionally flooded, stony-----	A	January February March July August September October December	---	---	---	---	---	---	Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief	Occasional Occasional Occasional Occasional Occasional Occasional Occasional	
1510: Carrizo, very gravelly sandy loam-----	A	---	---	---	---	---	---	---	---	---	
1511: Carrizo, channeled-----	A	January February March July August September December	---	---	---	---	---	---	Very brief Very brief Very brief Very brief Very brief Very brief Very brief	Rare Rare Rare Rare Rare Rare Rare	

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
1511: Carrizo, occasionally flooded-----	A	January	---	---	---	---	None	Very brief	Occasional
		February	---	---	---	---	None	Very brief	Occasional
		March	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		December	---	---	---	---	None	Very brief	Occasional
1512: Carrizo, extremely gravelly sandy loam----	A	---	---	---	---	---	---	---	---
1513: Carrizo-----	A	---	---	---	---	---	---	---	---
Carrizo, occasionally flooded, channeled-	A	January	---	---	---	---	None	Very brief	Occasional
		February	---	---	---	---	None	Very brief	Occasional
		March	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		December	---	---	---	---	None	Very brief	Occasional
Rubylee-----	A	---	---	---	---	---	---	---	---
1514: Carrizo, rarely flooded-----	A	January	---	---	---	---	None	Extremely brief	Rare
		February	---	---	---	---	None	Extremely brief	Rare
		March	---	---	---	---	None	Extremely brief	Rare
		July	---	---	---	---	None	Extremely brief	Rare
		August	---	---	---	---	None	Extremely brief	Rare
		September	---	---	---	---	None	Extremely brief	Rare
		December	---	---	---	---	None	Extremely brief	Rare
Pintobasin, fine sandy loam-----	A	---	---	---	---	---	---	---	---
Rubylee-----	A	---	---	---	---	---	---	---	---

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
1515: Pintobasin-----	A	---	---	---	---	---	---	---	---
Carrizo, occasionally flooded-----	A	January February March July August September December	---	---	---	---	None None None None None None None	Very brief Very brief Very brief Very brief Very brief Very brief Very brief	Occasional Occasional Occasional Occasional Occasional Occasional Occasional
1516: Pintobasin, fine sandy loam-----	A	---	---	---	---	---	---	---	---
1517: Pintobasin-----	A	---	---	---	---	---	---	---	---
Dalelake-----	A	---	---	---	---	---	---	---	---
1520: Pintobasin, loamy sand-----	A	January February March July August September December	---	---	---	---	None None None None None None None	Very brief Very brief Very brief Very brief Very brief Very brief Very brief	Rare Rare Rare Rare Rare Rare Rare
1522: Pintobasin, rarely flooded-----	A	January February March July August September December	---	---	---	---	None None None None None None None	Very brief Very brief Very brief Very brief Very brief Very brief Very brief	Rare Rare Rare Rare Rare Rare Rare



Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
1523: Pintobasin, rarely flooded-----	A	January	---	---	---	---	None	Very brief	Rare
		February	---	---	---	---	None	Very brief	Rare
		March	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		December	---	---	---	---	None	Very brief	Rare
Aquapeak-----	D	---	---	---	---	---	---	---	---
Pintobasin, occasionally flooded-----	A	January	---	---	---	---	---	Extremely brief	Occasional
		February	---	---	---	---	---	Extremely brief	Rare
		March	---	---	---	---	---	Extremely brief	Rare
		July	---	---	---	---	---	Extremely brief	Rare
		August	---	---	---	---	---	Extremely brief	Occasional
		September	---	---	---	---	---	Extremely brief	Occasional
		October	---	---	---	---	---	Extremely brief	Rare
		November	---	---	---	---	---	Extremely brief	Rare
		December	---	---	---	---	---	Extremely brief	Occasional
1524: Pintobasin, rarely flooded-----	A	January	---	---	---	---	None	Very brief	Rare
		February	---	---	---	---	None	Very brief	Rare
		March	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		December	---	---	---	---	None	Very brief	Rare
1525: Pintobasin, occasionally flooded-----	A	January	---	---	---	---	None	Very brief	Occasional
		February	---	---	---	---	None	Very brief	Occasional
		March	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		December	---	---	---	---	None	Very brief	Occasional

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Table 24.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
1525: Pintobasin, rarely flooded-----	A	January February March July August September December	---	---	---	---	None	Very brief Very brief Very brief Very brief Very brief Very brief	Rare Rare Rare Rare Rare Rare
1526: Pintobasin, rarely flooded-----	A	January February March July August September December	---	---	---	---	None	Very brief Very brief Very brief Very brief Very brief Very brief	Rare Rare Rare Rare Rare Rare
Joetree-----	A	January February March April May June July August September October November December	---	---	---	---	None	Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief	Rare Rare Rare Rare Rare Rare Rare Rare Rare Rare Rare Rare
Patscamp-----	B	---	---	---	---	---	---	---	---
1527: Pintobasin, moist-----	A	---	---	---	---	---	---	---	---
1530: Dalelake, fine sand-----	A	---	---	---	---	---	---	---	---

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water		Ponding		Flooding	
			Upper limit	Lower limit	depth		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>					
1531: Dalelake-----	A	---	---	---	---		---	---	---	---
Pintobasin, rarely flooded-----	A	January February March July August September December	---	---	---		---	None	Very brief	Rare
			---	---	---		---	None	Very brief	Rare
			---	---	---		---	None	Very brief	Rare
			---	---	---		---	None	Very brief	Rare
			---	---	---		---	None	Very brief	Rare
			---	---	---		---	None	Very brief	Rare
			---	---	---		---	None	Very brief	Rare
1540: Carrizo, very rarely flooded-----	A	January February March July August September December	---	---	---		---	None	Extremely brief	Very rare
			---	---	---		---	None	Extremely brief	Very rare
			---	---	---		---	None	Extremely brief	Very rare
			---	---	---		---	None	Extremely brief	Very rare
			---	---	---		---	None	Extremely brief	Very rare
			---	---	---		---	None	Extremely brief	Very rare
Carrizo, stable-----	A	---	---	---	---		---	---	---	---
Carrizo, occasionally flooded, rocky surface-----	A	January February March July August September December	---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
Russiroks-----	C	---	---	---	---		---	---	---	---
1541: Carrizo, stable-----	A	---	---	---	---		---	---	---	---
Cambidic Haplodurids-----	D	---	---	---	---		---	---	---	---

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Table 24.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding		Flooding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency	
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>					
1542: Carrizo, very rarely flooded-----	A	January	---	---	---	---	None	Extremely brief	Very rare	
		February	---	---	---	---	None	Extremely brief	Very rare	
		March	---	---	---	---	None	Extremely brief	Very rare	
		July	---	---	---	---	None	Extremely brief	Very rare	
		August	---	---	---	---	None	Extremely brief	Very rare	
		September	---	---	---	---	None	Extremely brief	Very rare	
		December	---	---	---	---	None	Extremely brief	Very rare	
Carrizo, occasionally flooded-----	A	January	---	---	---	---	None	Very brief	Occasional	
		February	---	---	---	---	None	Very brief	Occasional	
		March	---	---	---	---	None	Very brief	Occasional	
		July	---	---	---	---	None	Very brief	Occasional	
		August	---	---	---	---	None	Very brief	Occasional	
		September	---	---	---	---	None	Very brief	Occasional	
		December	---	---	---	---	None	Very brief	Occasional	
1550: Buzzardsprings, stable-----	A	---	---	---	---	---	---	---	---	
Coxpin-----	D	---	---	---	---	---	---	---	---	
Dalelake-----	A	---	---	---	---	---	---	---	---	
1555: Goldrose-----	A	---	---	---	---	---	---	---	---	
Carsitas, very rarely flooded-----	A	January	---	---	---	---	None	Extremely brief	Very rare	
		February	---	---	---	---	None	Extremely brief	Very rare	
		March	---	---	---	---	None	Extremely brief	Very rare	
		July	---	---	---	---	None	Extremely brief	Very rare	
		August	---	---	---	---	None	Extremely brief	Very rare	
		September	---	---	---	---	None	Extremely brief	Very rare	
		October	---	---	---	---	None	Extremely brief	Very rare	
		December	---	---	---	---	None	Very brief	Very rare	

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
1555: Chemwash, rarely flooded-----	A	January February March July August September October December	---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
2003: Emptygun-----	A	---	---	---	---	---	---	---	---
2060: Joetree, very rarely flooded-----	B	January February March April May June July August September October November December	---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
			---	---	---	---	None	Extremely brief	Very rare
Dalelake-----	A	---	---	---	---	---	---	---	---
Pintobasin, fine sandy loam-----	A	---	---	---	---	---	---	---	---
2065: Dalelake-----	A	---	---	---	---	---	---	---	---
Aquapeak-----	D	Jan-Dec	---	---	---	---	None	---	None
Coxpin-----	D	---	---	---	---	---	---	---	---

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding		Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
2067: Aquapeak, overblown-----	D	--	--	--	--	--	--	--	--
Buzzardsprings-----	A	--	--	--	--	--	--	--	--
Dalelake, thick sandy surface-----	A	--	--	--	--	--	--	--	--
Buzzardsprings, steep-----	A	--	--	--	--	--	--	--	--
2068: Aquapeak-----	D	--	--	--	--	--	--	--	--
Carpetflat, nongravelly surface-----	D	--	--	--	--	--	--	--	--
Pintobasin-----	A	--	--	--	--	--	--	--	--
2070: Missionsweet-----	D	--	--	--	--	--	--	--	--
Carpetflat-----	D	--	--	--	--	--	--	--	--
2075: Oldale-----	C	--	--	--	--	--	--	--	--
Missionsweet-----	D	--	--	--	--	--	--	--	--
2076: Oldale-----	C	--	--	--	--	--	--	--	--
Carrizo-----	A	--	--	--	--	--	--	--	--

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
2077: Oldale-----	C	---	---	---	---	---	---	---	---
Carrizo-----	A	---	---	---	---	---	---	---	---
Carrizo, very rarely flooded-----	A	January February March July August September December	---	---	---	---	None None None None None None None	Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief	Very rare Very rare Very rare Very rare Very rare Very rare Very rare
2085: Rainbowsend-----	D	---	---	---	---	---	---	---	---
Goldenbell-----	D	---	---	---	---	---	---	---	---
2090: Deprave-----	C	---	---	---	---	---	---	---	---
Rockhound-----	B	---	---	---	---	---	---	---	---
Rizzo-----	A	---	---	---	---	---	---	---	---
2091: Deprave-----	C	---	---	---	---	---	---	---	---
Roostertail-----	A	---	---	---	---	---	---	---	---
2100: Perurose-----	A	---	---	---	---	---	---	---	---
Coxpin-----	D	---	---	---	---	---	---	---	---

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding		Flooding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency	
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>					
2100: Pintobasin, gravelly surface-----	A	---	---	---	---	---	---	---	---	---
2101: Perurose, rarely flooded-----	A	January February March April May June July August September October November December	---	---	---	---	---	None	Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief	Rare Rare Rare Rare Rare Rare Rare Rare Rare Rare Rare Rare
Pintobasin, rarely flooded-----	A	January February March July August September December	---	---	---	---	---	None	Very brief Very brief Very brief Very brief Very brief Very brief Very brief	Rare Rare Rare Rare Rare Rare Rare
2110: Descent-----	A	---	---	---	---	---	---	---	---	---
Descent, stable-----	A	---	---	---	---	---	---	---	---	---
2111: Descent, warm-----	A	---	---	---	---	---	---	---	---	---
Rubylee, very rarely flooded-----	A	---	---	---	---	---	---	---	---	---



Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water		Ponding		Flooding	
			Upper limit	Lower limit	depth	depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
2120: Rizzo, rarely flooded-----	A	January February March July August September October December	---	---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	---	None	Extremely brief	Rare
Deprave-----	C	---	---	---	---	---	---	---	---	---
Rizzo, frequently flooded-----	A	January February March July August September October December	---	---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	---	None	Extremely brief	Frequent
2121: Rizzo, rubbly-----	A	---	---	---	---	---	---	---	---	---
2130: Goldenbell-----	D	---	---	---	---	---	---	---	---	---
Descent-----	A	---	---	---	---	---	---	---	---	---
2140: Rockhound, cobbly-----	C	---	---	---	---	---	---	---	---	---
2402: Rizzo-----	A	---	---	---	---	---	---	---	---	---

Table 24.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding		Flooding				
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency		
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>						
2402: Rizzo, frequently flooded-----	A	January	---	---	---	---	None	Extremely brief	Frequent		
		February	---	---	---	---	None	Extremely brief	Frequent		
		March	---	---	---	---	None	Extremely brief	Frequent		
		July	---	---	---	---	None	Extremely brief	Frequent		
		August	---	---	---	---	None	Extremely brief	Frequent		
		September	---	---	---	---	None	Extremely brief	Frequent		
		October	---	---	---	---	None	Extremely brief	Frequent		
		December	---	---	---	---	None	Extremely brief	Frequent		
2403: Rizzo-----	A	---	---	---	---	---	---	---	---		
		January	---	---	---	---	None	Extremely brief	Occasional		
		February	---	---	---	---	None	Extremely brief	Occasional		
		March	---	---	---	---	None	Extremely brief	Occasional		
		July	---	---	---	---	None	Extremely brief	Occasional		
		August	---	---	---	---	None	Extremely brief	Occasional		
		September	---	---	---	---	None	Extremely brief	Occasional		
		December	---	---	---	---	None	Extremely brief	Occasional		
2404: Rizzo, occasionally flooded-----	A	January	---	---	---	---	None	Extremely brief	Occasional		
		February	---	---	---	---	None	Extremely brief	Occasional		
		March	---	---	---	---	None	Extremely brief	Occasional		
		July	---	---	---	---	None	Extremely brief	Occasional		
		August	---	---	---	---	None	Extremely brief	Occasional		
		September	---	---	---	---	None	Extremely brief	Occasional		
		October	---	---	---	---	None	Extremely brief	Occasional		
		December	---	---	---	---	None	Extremely brief	Occasional		
Rizzo, very rarely flooded-----	A	January	---	---	---	---	None	Extremely brief	Very rare		
		February	---	---	---	---	None	Extremely brief	Very rare		
		March	---	---	---	---	None	Extremely brief	Very rare		
		July	---	---	---	---	None	Extremely brief	Very rare		
		August	---	---	---	---	None	Extremely brief	Very rare		
		September	---	---	---	---	None	Extremely brief	Very rare		
		October	---	---	---	---	None	Extremely brief	Very rare		
		December	---	---	---	---	None	Extremely brief	Very rare		

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
2405: Carrizo, rarely flooded-----	A	January	---	---	---	---	None	Extremely brief	Rare
		February	---	---	---	---	None	Extremely brief	Rare
		March	---	---	---	---	None	Extremely brief	Rare
		July	---	---	---	---	None	Extremely brief	Rare
		August	---	---	---	---	None	Extremely brief	Rare
		September	---	---	---	---	None	Extremely brief	Rare
		December	---	---	---	---	None	Extremely brief	Rare
Carrizo, occasionally flooded-----	A	January	---	---	---	---	None	Very brief	Occasional
		February	---	---	---	---	None	Very brief	Occasional
		March	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		December	---	---	---	---	None	Very brief	Occasional
2406: Pintobasin, frequently flooded-----	A	January	---	---	---	---	None	Very brief	Frequent
		February	---	---	---	---	None	Very brief	Frequent
		March	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		September	---	---	---	---	None	Very brief	Frequent
		December	---	---	---	---	None	Very brief	Frequent
Carrizo, occasionally flooded-----	A	January	---	---	---	---	None	Very brief	Occasional
		February	---	---	---	---	None	Very brief	Occasional
		March	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		December	---	---	---	---	None	Very brief	Occasional
2407: Pintobasin, rarely flooded-----	A	January	---	---	---	---	None	Very brief	Rare
		February	---	---	---	---	None	Very brief	Rare
		March	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		December	---	---	---	---	None	Very brief	Rare

Table 24.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding		Flooding					
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency			
2407: Carrizo, occasionally flooded-----	A		<u>Ft</u>	<u>Ft</u>	<u>Ft</u>							
		January	---	---	---	---	None	Very brief	Occasional			
		February	---	---	---	---	None	Very brief	Occasional			
		March	---	---	---	---	None	Very brief	Occasional			
		July	---	---	---	---	None	Very brief	Occasional			
		August	---	---	---	---	None	Very brief	Occasional			
		September	---	---	---	---	None	Very brief	Occasional			
		December	---	---	---	---	None	Very brief	Occasional			
		January	---	---	---	---	None	Very brief	Frequent			
		February	---	---	---	---	None	Very brief	Frequent			
		March	---	---	---	---	None	Very brief	Frequent			
2408: Rizzo, frequently flooded-----	A	January	---	---	---	---	None	Extremely brief	Frequent			
		February	---	---	---	---	None	Extremely brief	Frequent			
		March	---	---	---	---	None	Extremely brief	Frequent			
		July	---	---	---	---	None	Extremely brief	Frequent			
		August	---	---	---	---	None	Extremely brief	Frequent			
		September	---	---	---	---	None	Extremely brief	Frequent			
		October	---	---	---	---	None	Extremely brief	Frequent			
		December	---	---	---	---	None	Extremely brief	Frequent			
		January	---	---	---	---	None	Extremely brief	Very rare			
		February	---	---	---	---	None	Extremely brief	Very rare			
		March	---	---	---	---	None	Extremely brief	Very rare			
Rizzo, very rarely flooded-----	A	January	---	---	---	---	None	Extremely brief	Very rare			
		February	---	---	---	---	None	Extremely brief	Very rare			
		March	---	---	---	---	None	Extremely brief	Very rare			
		July	---	---	---	---	None	Extremely brief	Very rare			
		August	---	---	---	---	None	Extremely brief	Very rare			
		September	---	---	---	---	None	Extremely brief	Very rare			
		December	---	---	---	---	None	Extremely brief	Very rare			
		January	---	---	---	---	None	Extremely brief	Very rare			
		February	---	---	---	---	None	Extremely brief	Very rare			
		March	---	---	---	---	None	Extremely brief	Very rare			
		July	---	---	---	---	None	Extremely brief	Very rare			

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Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
2420: Carsitas, occasionally flooded-----	A	January	---	---	---	---	None	Extremely brief	Occasional
		February	---	---	---	---	None	Extremely brief	Occasional
		March	---	---	---	---	None	Extremely brief	Occasional
		July	---	---	---	---	None	Extremely brief	Occasional
		August	---	---	---	---	None	Extremely brief	Occasional
		September	---	---	---	---	None	Extremely brief	Occasional
		October	---	---	---	---	None	Extremely brief	Occasional
		December	---	---	---	---	None	Extremely brief	Occasional
		January	---	---	---	---	None	Extremely brief	Rare
		February	---	---	---	---	None	Extremely brief	Rare
		March	---	---	---	---	None	Extremely brief	Rare
2421: Carsitas, very rarely flooded-----	A	July	---	---	---	---	None	Extremely brief	Rare
		August	---	---	---	---	None	Extremely brief	Rare
		September	---	---	---	---	None	Extremely brief	Rare
		October	---	---	---	---	None	Extremely brief	Rare
		December	---	---	---	---	None	Extremely brief	Rare
		January	---	---	---	---	None	Very brief	Very rare
		February	---	---	---	---	None	Very brief	Very rare
		March	---	---	---	---	None	Very brief	Very rare
		July	---	---	---	---	None	Very brief	Very rare
		August	---	---	---	---	None	Very brief	Very rare
		September	---	---	---	---	None	Very brief	Very rare
Carsitas, rarely flooded-----	A	December	---	---	---	---	None	Very brief	Very rare
		January	---	---	---	---	None	Extremely brief	Rare
		February	---	---	---	---	None	Extremely brief	Rare
		March	---	---	---	---	None	Extremely brief	Rare
		July	---	---	---	---	None	Extremely brief	Rare
		August	---	---	---	---	None	Extremely brief	Rare
		September	---	---	---	---	None	Extremely brief	Rare
		October	---	---	---	---	None	Extremely brief	Rare
		December	---	---	---	---	None	Extremely brief	Rare
		January	---	---	---	---	None	Extremely brief	Rare

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
2431: Chemwash, frequently flooded, braided----	A	January February March July August September October December	---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	None	Extremely brief	Frequent
			---	---	---	---	None	Extremely brief	Frequent
Chemwash, frequently flooded-----	A	January February March July August September October December	---	---	---	---	None	Very brief	Frequent
			---	---	---	---	None	Very brief	Frequent
			---	---	---	---	None	Very brief	Frequent
			---	---	---	---	None	Very brief	Frequent
			---	---	---	---	None	Very brief	Frequent
			---	---	---	---	None	Very brief	Frequent
			---	---	---	---	None	Very brief	Frequent
			---	---	---	---	None	Very brief	Frequent
2440: Rizzo-----	A	---	---	---	---	---	---	---	---
Rizzo, occasionally flooded-----	A	January February March July August September October December	---	---	---	---	None	Extremely brief	Occasional
			---	---	---	---	None	Extremely brief	Occasional
			---	---	---	---	None	Extremely brief	Occasional
			---	---	---	---	None	Extremely brief	Occasional
			---	---	---	---	None	Extremely brief	Occasional
			---	---	---	---	None	Extremely brief	Occasional
			---	---	---	---	None	Extremely brief	Occasional
Rizzo, extremely stony-----	A	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---
2715: Dalelake-----	A	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---
Sheephole-----	A	Jan-Dec	---	---	---	---	None	---	None
			---	---	---	---	---	---	---
Pintobasin-----	A	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
2716: Dalelake, steep-----	A	--	--	--	--	--	--	--	--
Dalelake-----	A	--	--	--	--	--	--	--	--
2717: Dalelake-----	A	--	--	--	--	--	--	--	--
Rock outcrop.									
Buzzardsprings, fine sand-----	A	--	--	--	--	--	--	--	--
2718: Dalelake-----	A	--	--	--	--	--	--	--	--
Sheephole, gravelly surface-----	A	--	--	--	--	--	--	--	--
2820: Rock outcrop.									
Impedimenta-----	D	--	--	--	--	--	--	--	--
2825: Rock outcrop.									
Supplymine-----	A	--	--	--	--	--	--	--	--
Bolero, dry-----	D	--	--	--	--	--	--	--	--
Ironage-----	A	--	--	--	--	--	--	--	--
2830: Rock outcrop.									
Blackeagle, cool-----	D	--	--	--	--	--	--	--	--



Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency		Duration	Frequency	
2835: Rock outcrop.											
Blackeagle-----	D	---	---	---	---	---	---		---	---	
2840: Rock outcrop.											
Jadestorm-----	D	---	---	---	---	---	---		---	---	
3110: Coppermine, cool-----	D	---	---	---	---	---	---		---	---	
Stranger-----	D	---	---	---	---	---	---		---	---	
3120: Aguilareal-----	D	---	---	---	---	---	---		---	---	
Blackeagle-----	D	---	---	---	---	---	---		---	---	
Rock outcrop.											
3213: Dalvord-----	D	---	---	---	---	---	---		---	---	
Aguilareal-----	D	---	---	---	---	---	---		---	---	
Rock outcrop.											
3242: Langwell-----	D	---	---	---	---	---	---		---	---	
Rock outcrop.											
Helendale, cool-----	A	---	---	---	---	---	---		---	---	

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency		Duration	Frequency	
3285: Pinecity-----	D	---	---	---	Ft ---	---	---	---	---	---	---
Contactmine-----	C	---	---	---	---	---	---	---	---	---	---
Desertqueen-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
3286: Pinecity, gravelly loamy sand-----	D	---	---	---	---	---	---	---	---	---	---
3291: Smithcanyon-----	D	---	---	---	---	---	---	---	---	---	---
Stubbespring-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
3292: Smithcanyon-----	D	---	---	---	---	---	---	---	---	---	---
Pinecity-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
3293: Smithcanyon-----	D	---	---	---	---	---	---	---	---	---	---
Pinecity-----	D	---	---	---	---	---	---	---	---	---	---
3294: Smithcanyon, dry-----	D	---	---	---	---	---	---	---	---	---	---

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency	Duration	Frequency
3295: Desertqueen, dry-----	D	---	---	---	---	---	---	---	---	---	---
Hexie-----	A	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
3296: Desertqueen-----	D	---	---	---	---	---	---	---	---	---	---
Pinecity-----	D	---	---	---	---	---	---	---	---	---	---
3297: Desertqueen, warm-----	D	---	---	---	---	---	---	---	---	---	---
Contactmine, dry-----	C	---	---	---	---	---	---	---	---	---	---
Seanna, dry-----	D	---	---	---	---	---	---	---	---	---	---
3325: Ironped, warm-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Hexie-----	A	---	---	---	---	---	---	---	---	---	---
Ironped-----	D	---	---	---	---	---	---	---	---	---	---
3335: Xeric Torriorthents-----	A	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Xeric Torriorthents, warm-----	A	---	---	---	---	---	---	---	---	---	---

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
3336: Xeric Torriorthents-----	A	---	---	---	---				
Bigbernie-----	A	---	---	---	---			---	---
3340: Seanna-----	D	---	---	---	---			---	---
Grubstake, moist-----	D	---	---	---	---			---	---
Pinecity-----	D	---	---	---	---			---	---
3345: Bigcanyon-----	A	---	---	---	---			---	---
Bigcanyon, cool-----	A	---	---	---	---			---	---
3440: Pacific Mesa, steep-----	D	---	---	---	---			---	---
Pacific Mesa-----	D	---	---	---	---			---	---
3509: Cajon, very rarely flooded-----	A	January February March July August September December	---	---	---			None None None None None None None	Very rare Very rare Very rare Very rare Very rare Very rare Very rare
Friedliver-----	B	---	---	---	---			---	---

Table 24.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
3525: Cajon-----	A	January February March July August September December	---	---	---	---	None	Very brief	Very rare
			---	---	---	---	None	Very brief	Very rare
			---	---	---	---	None	Very brief	Very rare
			---	---	---	---	None	Very brief	Very rare
			---	---	---	---	None	Very brief	Very rare
			---	---	---	---	None	Very brief	Very rare
			---	---	---	---	None	Very brief	Very rare
Friedliver-----	A	January February March July August September December	---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
			---	---	---	---	None	Extremely brief	Rare
3526: Cajon-----	A	January February March July August September December	---	---	---	---	None	Very brief	Rare
			---	---	---	---	None	Very brief	Rare
			---	---	---	---	None	Very brief	Rare
			---	---	---	---	None	Very brief	Rare
			---	---	---	---	None	Very brief	Rare
			---	---	---	---	None	Very brief	Rare
			---	---	---	---	None	Very brief	Rare
Hypoint-----	A	---	---	---	---	---	---	---	---
Arizo, occasionally flooded-----	A	January February March July August September December	---	---	---	---	None	Very brief	Occasional
			---	---	---	---	None	Very brief	Occasional
			---	---	---	---	None	Very brief	Occasional
			---	---	---	---	None	Very brief	Occasional
			---	---	---	---	None	Very brief	Occasional
			---	---	---	---	None	Very brief	Occasional
3611: Burntshack, sand surface-----	A	---	---	---	---	---	---	---	---
Burntshack-----	A	---	---	---	---	---	---	---	---

Table 24.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding		Flooding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency	
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>					
3612: Burntshack-----	A	---	---	---	---					---
Burntshack, occasionally flooded-----	A	January February March July August September December	---	---	---			None	Very brief Very brief Very brief Very brief Very brief Very brief Very brief	Occasional Occasional Occasional Occasional Occasional Occasional Occasional
3676: Morongo, loamy sand, very rarely flooded-----	A	January February March July August September December	---	---	---			None	Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief	Very rare Very rare Very rare Very rare Very rare Very rare Very rare
3677: Morongo-----	A	---	---	---	---					---
3679: Morongo, cool-----	A	---	---	---	---					---
Jumborox-----	A	---	---	---	---					---
3680: Morongo-----	A	---	---	---	---					---
3681: Morongo, very rarely flooded-----	A	January February March July August September December	---	---	---			None	Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief Extremely brief	Very rare Very rare Very rare Very rare Very rare Very rare Very rare

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Table 24.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency		Duration	Frequency	
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>						
3681: Jumborox, dry-----	A	---	---	---	---	---	---		---	---	
3682: Morongo, cool-----	A	---	---	---	---	---	---		---	---	
Jumborox-----	A	---	---	---	---	---	---		---	---	
Urban land.											
3683: Morongo-----	A	---	---	---	---	---	---		---	---	
Bluecut, very rarely flooded-----	B	---	---	---	---	---	---		---	---	
3684: Morongo, warm-----	A	---	---	---	---	---	---		---	---	
3685: Morongo, cool-----	A	---	---	---	---	---	---		---	---	
Desertqueen, undulating-----	D	---	---	---	---	---	---		---	---	
3690: Nasagold-----	A	---	---	---	---	---	---		---	---	
3695: Gocougs-----	C	---	---	---	---	---	---		---	---	
4031: Crosgrain-----	D	---	---	---	---	---	---		---	---	
Crackerjack-----	D	---	---	---	---	---	---		---	---	
Pinkcan, dry-----	B	---	---	---	---	---	---		---	---	

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
4041: Silvermine	D	---	---	---	---	---	---	---	---
Helendale	A	---	---	---	---	---	---	---	
Burntshack, very rarely flooded	A	January	---	---	---	---	None	Extremely brief	Very rare
		February	---	---	---	---	None	Extremely brief	Very rare
		March	---	---	---	---	None	Extremely brief	Very rare
		July	---	---	---	---	None	Extremely brief	Very rare
		August	---	---	---	---	None	Extremely brief	Very rare
		September	---	---	---	---	None	Extremely brief	Very rare
		December	---	---	---	---	None	Extremely brief	Very rare
4064: Gravesunit	A	---	---	---	---	---	---	---	
Helendale, sandy surface	A	---	---	---	---	---	---	---	
4071: Helendale	A	---	---	---	---	---	---	---	
Desertqueen, very rarely flooded	D	---	---	---	---	---	---	---	
4091: Littlefargo	A	---	---	---	---	---	---	---	
4245: Bluecut	B	---	---	---	---	---	---	---	
Morongo, very rarely flooded	A	January	---	---	---	---	None	Extremely brief	Very rare
		February	---	---	---	---	None	Extremely brief	Very rare
		March	---	---	---	---	None	Extremely brief	Very rare
		July	---	---	---	---	None	Extremely brief	Very rare
		August	---	---	---	---	None	Extremely brief	Very rare
		September	---	---	---	---	None	Extremely brief	Very rare
		December	---	---	---	---	None	Extremely brief	Very rare



Table 24.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding		Flooding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency	
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>					
4245: Yander, very rarely flooded-----	A	January	---	---	---	---	None	Extremely brief	Very rare	
		February	---	---	---	---	None	Extremely brief	Very rare	
		March	---	---	---	---	None	Extremely brief	Very rare	
		July	---	---	---	---	None	Extremely brief	Very rare	
		August	---	---	---	---	None	Extremely brief	Very rare	
		September	---	---	---	---	None	Extremely brief	Very rare	
		December	---	---	---	---	None	Extremely brief	Very rare	
4260: Minhoyt-----	D	---	---	---	---	---	---	---		
Corbilt, rarely flooded-----	A	January	---	---	---	---	None	Very brief	Rare	
		February	---	---	---	---	None	Very brief	Rare	
		March	---	---	---	---	None	Very brief	Rare	
		July	---	---	---	---	None	Very brief	Rare	
		August	---	---	---	---	None	Very brief	Rare	
		September	---	---	---	---	None	Very brief	Rare	
		December	---	---	---	---	None	Very brief	Very rare	
4265: Werewolf, warm-----	B	---	---	---	---	---	---	---		
4270: Yuccabutte, extremely cobbly sandy loam--	C	---	---	---	---	---	---	---		
4271: Yuccabutte, warm-----	C	---	---	---	---	---	---	---		
Arizo, rarely flooded-----	A	January	---	---	---	---	None	Extremely brief	Rare	
		February	---	---	---	---	None	Extremely brief	Rare	
		March	---	---	---	---	None	Extremely brief	Rare	
		July	---	---	---	---	None	Extremely brief	Rare	
		August	---	---	---	---	None	Extremely brief	Rare	
		September	---	---	---	---	None	Extremely brief	Rare	
		December	---	---	---	---	None	Extremely brief	Rare	

Table 24.-Water Features-Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding		Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
4275: Pinkcan-----	B	--	---	---	---	---	---	---	---
Werewolf-----	A	--	---	---	---	---	---	---	---
Gocougs, warm-----	D	--	---	---	---	---	---	---	---
4280: Mekkadale-----	D	--	---	---	---	---	---	---	---
Edalph, warm-----	A	--	---	---	---	---	---	---	---
4285: Typic Argidurids-----	D	--	---	---	---	---	---	---	---
Coppermine-----	D	--	---	---	---	---	---	---	---
Minhoyt, warm-----	D	--	---	---	---	---	---	---	---
4403: Arizo, rarely flooded, channeled-----	A	January	---	---	---	---	None	Extremely brief	Rare
		February	---	---	---	---	None	Extremely brief	Rare
		March	---	---	---	---	None	Extremely brief	Rare
		July	---	---	---	---	None	Extremely brief	Rare
		August	---	---	---	---	None	Extremely brief	Rare
		September	---	---	---	---	None	Extremely brief	Rare
		December	---	---	---	---	None	Extremely brief	Rare
Arizo, rarely flooded-----	A	January	---	---	---	---	None	Very brief	Rare
		February	---	---	---	---	None	Very brief	Rare
		March	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		December	---	---	---	---	None	Very brief	Rare

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Surface water		Ponding		Flooding	
			Upper limit	Lower limit	depth		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>					
4403: Arizo-----	A	---	---	---	---		---	---	---	---
4440: Dragonwash, occasionally flooded-----	A	January February March July August September December	---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
Dragonwash, frequently flooded-----	A	January February March July August September December	---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
4450: Morongo, occasionally flooded-----	A	January February March July August September December	---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
			---	---	---		---	None	Very brief	Occasional
Morongo, frequently flooded-----	A	January February March July August September December	---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
			---	---	---		---	None	Very brief	Frequent
4605: Pinecity, moist-----	D	---	---	---	---		---	---	---	---

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency	Duration	Frequency
4606: Pinecity-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
4607: Pinecity-----	D	---	---	---	---	---	---	---	---	---	---
4608: Pinecity-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
4610: Desertqueen-----	D	---	---	---	---	---	---	---	---	---	---
Jumborox, warm-----	A	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
4615: Desertqueen, cool-----	D	---	---	---	---	---	---	---	---	---	---
Jumborox-----	A	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
4620: Stranger-----	D	---	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Grubstake, moist-----	D	---	---	---	---	---	---	---	---	---	---

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding		
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency	Duration	Frequency
4625: Grinder-----	D	---	---	---	---	---	---	---	---	---	---
Grinder, cool-----	D	---	---	---	---	---	---	---	---	---	---
Pinkcan, cool-----	B	---	---	---	---	---	---	---	---	---	---
4630: Thunderclap-----	A	---	---	---	---	---	---	---	---	---	---
Smithcanyon-----	D	---	---	---	---	---	---	---	---	---	---
4804: Rock outcrop.											
Ironped-----	D	Jan-Dec	---	---	---	---	None	---	None	---	None
Pinecity-----	D	---	---	---	---	---	---	---	---	---	---
4805: Rock outcrop.											
Ironped, cool-----	D	---	---	---	---	---	---	---	---	---	---
4806. Rock outcrop											
4811: Rock outcrop.											
Pioneertown-----	D	---	---	---	---	---	---	---	---	---	---
4825: Rock outcrop.											
Grubstake-----	D	---	---	---	---	---	---	---	---	---	---

Table 24.--Water Features--Continued

Map unit symbol and soil name	Hydro- logic group	Months	Water table		Ponding		Flooding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency	
4825: Cajon, rarely flooded-----	A		<u>Ft</u>	<u>Ft</u>	<u>Ft</u>					
		January	---	---	---	---	None	Very brief	Rare	
		February	---	---	---	---	None	Very brief	Rare	
		March	---	---	---	---	None	Very brief	Rare	
		July	---	---	---	---	None	Very brief	Rare	
		August	---	---	---	---	None	Very brief	Rare	
		September	---	---	---	---	None	Very brief	Rare	
		December	---	---	---	---	None	Very brief	Rare	
Stranger, warm-----	D	---	---	---	---	---	---	---	---	
4830: Rock outcrop.										
Pinecity, cool-----	D	---	---	---	---	---	---	---	---	---
4900: Rock outcrop.										
Aguilareal-----	D	---	---	---	---	---	---	---	---	---
Lostpalms-----	D	---	---	---	---	---	---	---	---	---

# Soil Survey of Joshua Tree National Park, California

Table 25.—Taxonomic Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Aguilareal-----	Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids
Ambrosia-----	Sandy, mixed, thermic Typic Haplocalcids
Aquapeak-----	Loamy, mixed, superactive, hyperthermic, shallow Argidic Argidurids
Arizo-----	Sandy-skeletal, mixed, thermic Typic Torriorthents
Bigbernie-----	Sandy-skeletal, mixed, thermic Typic Torriorthents
Bigcanyon-----	Mixed, thermic Typic Torripsamments
Blackeagle-----	Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplocambids
Blackmagic-----	Fine-loamy, mixed, superactive, thermic Typic Calciargids
Bluecut-----	Fine-loamy, mixed, superactive, thermic Typic Paleargids
Bolero-----	Sandy-skeletal, mixed, hyperthermic Lithic Torriorthents
Bulletproof-----	Sandy, mixed, hyperthermic, shallow Typic Torriorthents
Burntshack-----	Loamy, mixed, superactive, thermic Arenic Haplargids
Buzzardsprings-----	Sandy, mixed, hyperthermic Typic Haplocalcids
Cajon-----	Mixed, thermic Typic Torripsamments
Cambidic Haplodurids-----	Cambidic Haplodurids
Carpetflat-----	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids
*Carpetflat-----	Loamy, mixed, superactive, hyperthermic, shallow Cambidic Haplodurids
Carrizo-----	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Carsitas-----	Mixed, hyperthermic Typic Torripsamments
Catfishbay-----	Coarse-loamy, mixed, superactive, hyperthermic Typic Calciargids
Chemwash-----	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Contactmine-----	Fine-loamy, mixed, superactive, thermic Typic Haplargids
*Contactmine-----	Fine-loamy, mixed, superactive, hyperthermic Typic Haplargids
Coppermine-----	Loamy-skeletal, mixed, superactive, thermic Lithic Haplargids
Corbilt-----	Coarse-loamy, mixed, superactive, thermic Duric Haplocalcids
Coxpin-----	Sandy, mixed, hyperthermic, shallow Cambidic Haplodurids
Crackerjack-----	Loamy, mixed, superactive, thermic, shallow Cambidic Haplodurids
Cronese-----	Coarse-loamy, mixed, superactive, thermic Typic Haplocalcids
Crosgrain-----	Loamy-skeletal, mixed, superactive, thermic, shallow Typic Haplodurids
Dalelake-----	Mixed, hyperthermic Typic Torripsamments
Dalvord-----	Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Torriorthents
Deprave-----	Loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids
*Deprave-----	Coarse-loamy, mixed, superactive, hyperthermic Argidic Argidurids
Descent-----	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Desertqueen-----	Loamy, mixed, superactive, thermic, shallow Typic Haplargids
Dragonwash-----	Sandy-skeletal, mixed, thermic Typic Torriorthents
Edalph-----	Sandy, mixed, thermic Typic Haplocalcids
Emptygun-----	Sandy-skeletal, mixed, hyperthermic Typic Haplocalcids
Fanhill-----	Loamy, mixed, superactive, hyperthermic, shallow Typic Haplocambids
Friedliver-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Gocougs-----	Fine-loamy, mixed, superactive, thermic Argic Petrocalcids
Goldenbell-----	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Argidic Argidurids
Goldenhills-----	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Goldrose-----	Sandy, mixed, hyperthermic Typic Torriorthents
Gravesumit-----	Coarse-loamy, mixed, superactive, thermic Typic Calciargids
Grinder-----	Loamy, mixed, superactive, thermic Lithic Haplargids
Grubstake-----	Loamy, mixed, superactive, thermic, shallow Typic Haplocambids
Helendale-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Hexie-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Hypoint-----	Sandy, mixed, thermic Typic Torriorthents
Impedimenta-----	Mixed, hyperthermic Lithic Torripsamments
Ironage-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Calciargids
Ironlung-----	Sandy-skeletal, mixed, hyperthermic, shallow Typic Torriorthents
Ironped-----	Mixed, thermic, shallow Typic Torripsamments
Jadestorm-----	Loamy-skeletal, mixed, superactive, calcareous, hyperthermic, shallow Typic Torriorthents
Jetmine-----	Loamy, mixed, superactive, thermic, shallow Cambidic Haplodurids
Joetree-----	Mixed, hyperthermic Typic Torripsamments
Joshua-----	Fine-loamy, mixed, superactive, thermic Argidic Argidurids

# Soil Survey of Joshua Tree National Park, California

Table 25.—Taxonomic Classification of the Soils—Continued

Soil name	Family or higher taxonomic class
Jumborox-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Kenalduma-----	Loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids
Langwell-----	Loamy, mixed, superactive, calcareous, thermic Lithic Torriorthents
Littlefargo-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Lostpalms-----	Sandy-skeletal, mixed, thermic Lithic Torriorthents
Marbolite-----	Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplargids
Marsite-----	Loamy-skeletal, mixed, superactive, thermic, shallow Typic Haplodurids
Meccapass-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocambids
Mekkadale-----	Loamy, mixed, superactive, thermic, shallow Argidic Argidurids
Minhoyt-----	Loamy, mixed, superactive, thermic, shallow Typic Haplodurids
Missionsweet-----	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Cambidic Haplodurids
Missionwell-----	Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Torriorthents
Morongo-----	Mixed, thermic Typic Torripsamments
Nasagold-----	Coarse-loamy, mixed, superactive, thermic Typic Haplocambids
Oldale-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids
Olympus-----	Loamy, mixed, superactive, thermic Arenic Haplargids
Pacific Mesa-----	Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids
Patscamp-----	Fine-loamy, mixed, superactive, hyperthermic Calcic Paleargids
*Patscamp-----	Fine-loamy, mixed, superactive, hyperthermic Typic Paleargids
Perurose-----	Sandy, mixed, hyperthermic Cambidic Haplodurids
Pinecity-----	Mixed, thermic, shallow Typic Torripsamments
Pinkcan-----	Fine-loamy, mixed, superactive, thermic Duric Petroargids
Pintobasin-----	Mixed, hyperthermic Typic Torripsamments
Pioneertown-----	Mixed, thermic Lithic Torripsamments
Popups-----	Coarse-loamy, mixed, superactive, thermic Argidic Argidurids
Rainbowsend-----	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids
Rizzo-----	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Rockhound-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids
Roostertail-----	Loamy-skeletal, mixed, superactive, hyperthermic Duric Petroargids
Rubylee-----	Coarse-loamy, mixed, superactive, hyperthermic Typic Haplargids
Russiroks-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Calciargids
Seanna-----	Loamy-skeletal, mixed, superactive, calcareous, thermic, shallow Typic Torriorthents
*Seanna-----	Loamy, mixed, superactive, calcareous, thermic, shallow Typic Torriorthents
Sheephole-----	Sandy, mixed, hyperthermic Typic Torriorthents
Silvermine-----	Sandy, mixed, thermic, shallow Cambidic Haplodurids
Smithcanyon-----	Mixed, thermic, shallow Xeric Torripsamments
*Smithcanyon-----	Mixed, mesic, shallow Xeric Torripsamments
Snaggletooth-----	Fine-loamy, mixed, superactive, hyperthermic Typic Calciargids
Stranger-----	Mixed, thermic Lithic Torripsamments
Stubbespring-----	Loamy, mixed, superactive, thermic, shallow Xeric Haplargids
Sunmill-----	Coarse-loamy, mixed, superactive, hyperthermic Typic Calciargids
Supplymine-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocalcids
Thunderclap-----	Mixed, thermic Xeric Torripsamments
Typic Argidurids-----	Typic Argidurids
Typic Haplargids-----	Thermic Typic Haplargids
Typic Haplargids-----	Coarse-loamy, mixed, superactive, hyperthermic Typic Haplargids
Typic Haplocalcids-----	Sandy-skeletal, mixed, hyperthermic Typic Haplocalcids
*Typic Petrocalcids-----	Fine-loamy, mixed, superactive, thermic, shallow Thermic Typic Petrocalcids
Typic Torriorthents-----	Sandy-skeletal over loamy, mixed, hyperthermic Typic Torriorthents
Typic Torriorthents-----	Sandy, mixed, hyperthermic Typic Torriorthents
Typic Torriorthents-----	Fine-loamy, mixed, superactive, hyperthermic Typic Torriorthents
Werewolf-----	Loamy-skeletal, mixed, superactive, thermic Typic Haplargids
Whipple-----	Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplargids
*Whipple-----	Loamy-skeletal, mixed, superactive, thermic Lithic Haplargids
Whiterobe-----	Sandy, mixed, hyperthermic Typic Torriorthents
Xeric Torriorthents-----	Xeric Torriorthents
Yander-----	Mixed, thermic Typic Torripsamments
Yuccabutte-----	Loamy-skeletal, mixed, superactive, thermic Typic Haplargids



# Soil Survey of Joshua Tree National Park, California

Table 26.—Soil Classification Key

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series)

ORDER	
Suborder	
Great Group	
Subgroup	
Series or Higher Category	
ARIDISOLS	
Argids	
Haplargids	
Typic Haplargids	
Rubylee-----	Coarse-loamy, mixed, superactive, hyperthermic Typic Haplargids
Typic Haplargids-----	Coarse-loamy, mixed, superactive, hyperthermic Typic Haplargids
Friedliver-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Helendale-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Hexie-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Jumborox-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Littlefargo-----	Coarse-loamy, mixed, superactive, thermic Typic Haplargids
Contactmine-----	Fine-loamy, mixed, superactive, thermic Typic Haplargids
*Contactmine-----	Fine-loamy, mixed, superactive, hyperthermic Typic Haplargids
Desertqueen-----	Loamy, mixed, superactive, thermic, shallow Typic Haplargids
Oldale-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids
Rockhound-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids
Werewolf-----	Loamy-skeletal, mixed, superactive, thermic Typic Haplargids
Yuccabutte-----	Loamy-skeletal, mixed, superactive, thermic Typic Haplargids
Typic Haplargids-----	Thermic Typic Haplargids
Arenic Haplargids	
Burntshack-----	Loamy, mixed, superactive, thermic Arenic Haplargids
Olympus-----	Loamy, mixed, superactive, thermic Arenic Haplargids
Lithic Haplargids	
Grinder-----	Loamy, mixed, superactive, thermic Lithic Haplargids
Marbolite-----	Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplargids
Whipple-----	Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplargids
Coppermine-----	Loamy-skeletal, mixed, superactive, thermic Lithic Haplargids
*Whipple-----	Loamy-skeletal, mixed, superactive, thermic Lithic Haplargids
Xeric Haplargids	
Stubbespring-----	Loamy, mixed, superactive, thermic, shallow Xeric Haplargids
Paleargids	
Typic Paleargids	
*Patscamp-----	Fine-loamy, mixed, superactive, hyperthermic Typic Paleargids
Bluecut-----	Fine-loamy, mixed, superactive, thermic Typic Paleargids
Calcic Paleargids	
Patscamp-----	Fine-loamy, mixed, superactive, hyperthermic Calcic Paleargids
Petroargids	
Duric Petroargids	
Duric Petroargids-----	Duric Petroargids
Pinkcan-----	Fine-loamy, mixed, superactive, thermic Duric Petroargids
Roostertail-----	Loamy-skeletal, mixed, superactive, hyperthermic Duric Petroargids

# Soil Survey of Joshua Tree National Park, California

Table 26.—Soil Classification Key—Continued

ORDER	
Suborder	
Great Group	
Subgroup	
Series or Higher Category	
ARIDISOLS, Argids—Continued	
Calciargids	
Typic Calciargids	
Catfishbay-----	Coarse-loamy, mixed, superactive, hyperthermic Typic Calciargids
Sunmill-----	Coarse-loamy, mixed, superactive, hyperthermic Typic Calciargids
Gravesumit-----	Coarse-loamy, mixed, superactive, thermic Typic Calciargids
Snaggletooth-----	Fine-loamy, mixed, superactive, hyperthermic Typic Calciargids
Blackmagic-----	Fine-loamy, mixed, superactive, thermic Typic Calciargids
Ironage-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Calciargids
Russiroks-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Calciargids
Durids	
Argidurids	
Argidic Argidurids	
*Deprave-----	Coarse-loamy, mixed, superactive, hyperthermic Argidic Argidurids
Popups-----	Coarse-loamy, mixed, superactive, thermic Argidic Argidurids
Joshua-----	Fine-loamy, mixed, superactive, thermic Argidic Argidurids
Aquapeak-----	Loamy, mixed, superactive, hyperthermic, shallow Argidic Argidurids
Mekkadale-----	Loamy, mixed, superactive, thermic, shallow Argidic Argidurids
Deprave-----	Loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids
Kenalduma-----	Loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids
Goldenbell-----	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Argidic Argidurids
Typic Argidurids	
Typic Argidurids-----	Typic Argidurids
Haplodurids	
Cambidic Haplodurids	
Cambidic Haplodurids-----	Cambidic Haplodurids
*Carpetflat-----	Loamy, mixed, superactive, hyperthermic, shallow Cambidic Haplodurids
Crackerjack-----	Loamy, mixed, superactive, thermic, shallow Cambidic Haplodurids
Jetmine-----	Loamy, mixed, superactive, thermic, shallow Cambidic Haplodurids
Missionsweet-----	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Cambidic Haplodurids
Perurose-----	Sandy, mixed, hyperthermic Cambidic Haplodurids
Coxpin-----	Sandy, mixed, hyperthermic, shallow Cambidic Haplodurids
Silvermine-----	Sandy, mixed, thermic, shallow Cambidic Haplodurids
Typic Haplodurids	
Minhoyt-----	Loamy, mixed, superactive, thermic, shallow Typic Haplodurids
Carpetflat-----	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids
Rainbowsend-----	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids
Crosgrain-----	Loamy-skeletal, mixed, superactive, thermic, shallow Typic Haplodurids
Marsite-----	Loamy-skeletal, mixed, superactive, thermic, shallow Typic Haplodurids

# Soil Survey of Joshua Tree National Park, California

Table 26.—Soil Classification Key—Continued

ORDER	
Suborder	
Great Group	
Subgroup	
Series or Higher Category	
ARIDISOLS—Continued	
Calcids	
Haplocalcids	
Lithic Haplocalcids	
Lithic Haplocalcids-----	Thermic Lithic Haplocalcids
Duric Haplocalcids	
Corbilt-----	Coarse-loamy, mixed, superactive, thermic Duric Haplocalcids
Typic Haplocalcids	
Cronese-----	Coarse-loamy, mixed, superactive, thermic Typic Haplocalcids
Supplymine-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocalcids
Buzzardsprings-----	Sandy, mixed, hyperthermic Typic Haplocalcids
Ambrosia-----	Sandy, mixed, thermic Typic Haplocalcids
Edalph-----	Sandy, mixed, thermic Typic Haplocalcids
Emptygun-----	Sandy-skeletal, mixed, hyperthermic Typic Haplocalcids
Typic Haplocalcids-----	Sandy-skeletal, mixed, hyperthermic Typic Haplocalcids
Petrocalcids	
Argic Petrocalcids	
Gocougs-----	Fine-loamy, mixed, superactive, thermic Argic Petrocalcids
Typic Petrocalcids	
Typic Petrocalcids-----	Fine-loamy, mixed, superactive, thermic, shallow Typic Petrocalcids
Cambids	
Haplocambids	
Lithic Haplocambids	
Blackeagle-----	Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplocambids
Aguilareal-----	Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids
Pacific Mesa-----	Loamy-skeletal, mixed, superactive, thermic Lithic Haplocambids
Typic Haplocambids	
Nasagold-----	Coarse-loamy, mixed, superactive, thermic Typic Haplocambids
Fanhill-----	Loamy, mixed, superactive, hyperthermic, shallow Typic Haplocambids
Grubstake-----	Loamy, mixed, superactive, thermic, shallow Typic Haplocambids
Meccapass-----	Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocambids

# Soil Survey of Joshua Tree National Park, California

Table 26.—Soil Classification Key—Continued

ORDER	
Suborder	
Great Group	
Subgroup	
Series or Higher Category	
ENTISOLS	
Orthents	
Torriorthents	
Typic Torriorthents	
Typic Torriorthents	Fine-loamy, mixed, superactive, hyperthermic Typic Torriorthents
*Seanna	Loamy, mixed, superactive, calcareous, thermic, shallow Typic Torriorthents
Jadestorm	Loamy-skeletal, mixed, superactive, calcareous, hyperthermic, shallow Typic Torriorthents
Seanna	Loamy-skeletal, mixed, superactive, calcareous, thermic, shallow Typic Torriorthents
Goldrose	Sandy, mixed, hyperthermic Typic Torriorthents
Sheephole	Sandy, mixed, hyperthermic Typic Torriorthents
Typic Torriorthents	Sandy, mixed, hyperthermic Typic Torriorthents
Whiterobe	Sandy, mixed, hyperthermic Typic Torriorthents
Bulletproof	Sandy, mixed, hyperthermic, shallow Typic Torriorthents
Hypoint	Sandy, mixed, thermic Typic Torriorthents
Typic Torriorthents	Sandy-skeletal over loamy, mixed, hyperthermic Typic Torriorthents
Carrizo	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Chemwash	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Descent	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Goldenhills	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Rizzo	Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Ironlung	Sandy-skeletal, mixed, hyperthermic, shallow Typic Torriorthents
Arizo	Sandy-skeletal, mixed, thermic Typic Torriorthents
Bigbernie	Sandy-skeletal, mixed, thermic Typic Torriorthents
Dragonwash	Sandy-skeletal, mixed, thermic Typic Torriorthents
Lithic Torriorthents	
Langwell	Loamy, mixed, superactive, calcareous, thermic Lithic Torriorthents
Missionwell	Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Torriorthents
Dalvord	Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Torriorthents
Bolero	Sandy-skeletal, mixed, hyperthermic Lithic Torriorthents
Lostpalms	Sandy-skeletal, mixed, thermic Lithic Torriorthents
Xeric Torriorthents	
Xeric Torriorthents	Xeric Torriorthents
Torripsamments	
Typic Torripsamments	
Carsitas	Mixed, hyperthermic Typic Torripsamments
Dalelake	Mixed, hyperthermic Typic Torripsamments
Joetree	Mixed, hyperthermic Typic Torripsamments
Pintobasin	Mixed, hyperthermic Typic Torripsamments
Bigcanyon	Mixed, thermic Typic Torripsamments
Cajon	Mixed, thermic Typic Torripsamments
Morongo	Mixed, thermic Typic Torripsamments
Yander	Mixed, thermic Typic Torripsamments
Ironped	Mixed, thermic, shallow Typic Torripsamments
Pinecity	Mixed, thermic, shallow Typic Torripsamments
Lithic Torripsamments	
Impedimenta	Mixed, hyperthermic Lithic Torripsamments
Pioneertown	Mixed, thermic Lithic Torripsamments
Stranger	Mixed, thermic Lithic Torripsamments
Xeric Torripsamments	
*Smithcanyon	Mixed, mesic, shallow Xeric Torripsamments
Thunderclap	Mixed, thermic Xeric Torripsamments
Smithcanyon	Mixed, thermic, shallow Xeric Torripsamments

# Appendix

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## Image 1

Image 1 shows an overview of the Queens Valley and Pleasant Valley areas of Joshua Tree National Park, looking south from the town of Joshua Tree. An area of map unit 3680 is in the foreground, and an area of map unit 3676 is in the middle ground. Both units are dominated by the Morongo soil. These areas have very deep, alluvial deposits on fan aprons set amongst hills consisting of granitoid (e.g., map units 4804 and 3286) and uplifted, outcroppings of monzogranite of the White Tank Formation (e.g., the Wonderland of Rocks or map unit 4806). Map units 3676 and 4245 are very deep and deep, respectively, over monzogranite pediment surfaces. Map units 4605, 4606, and 4610 are very shallow and shallow pediment surfaces and consist of Pinecity soils with rock outcrop exposed throughout the units. The most northeastern edge of the Little San Bernardino Mountains is mapped as map unit 3293. On the north-facing slopes, the soils hold enough moisture to be considered as having an aridic bordering xeric soil moisture regime (Smithcanyon soils); on the south-facing slopes, the soils are the drier Pinecity soils with typical aridic soil moisture conditions. The Queens Valley area of the park is one of the most visible and well known areas of the park. The large protruding pieces of the White Tank Formation, mapped as map units 4806 and 4804, are well known to mountain climbers and hikers alike.

## Image 2

Image 2 shows an overview of the main basin area of Pinto Basin, looking north from the Eagle Mountains. The Coxcomb Mountains, dominated by granitoid rock outcroppings and Blackeagle soils, are on the east and northeast areas in the image (map unit 2830), while the Eagle Mountains with similar parent material and soils are on the southwest corner (map unit 2835). The eastern edge of San Bernardino Wash (the main drainage channel out of Pinto Basin) is in map unit 2420 and has active, young, very deep, sandy, alluvial soils (Carsitas soils). The surrounding fan aprons that drain into San Bernardino Wash (i.e., map units 1515, 1517, and 1530) are dominated by other young, very deep, sandy, alluvial soils (Pintobasin soils) and are slightly more stable landforms than the main drainage of San Bernardino Wash. Map units 2717 and 1530 have a major component of eolian or wind-deposited soils (Dalelake soils). The prevailing winds are from the southeast, and these eolian deposits are from nearby Palen Lake (just southeast of the park). Map unit 2060 receives eolian deposits and consists of both active, alluvial Pintobasin soils and buried, stable alluvial soils that contain a well developed argillic horizon (Joetree soils). The more pronounced stable soils in the area are in map units 2100 and 2110 along the mountain fronts. In map unit 2100, the soils are stable enough that weak duripans have formed at shallow and moderately deep depths below the mineral soil surface and include Pintobasin soils on the active inset fans. This portion of the park is unique in that it is a very deep basin that has mostly young alluvial soils with little to no development and is the largest inaccessible area of the park. Data was collected here via helicopter work done in 2009.

### Image 3

Image 3 shows an overview of the western edge of Joshua Tree National Park, looking west towards San Geronio and San Jacinto Peaks. The boundary of the park goes in and out of view due to the topography of the Little San Bernardino Mountains in this part of the park. The terrain in this area of the park is very steep throughout. Map units were accessed minimally, and concepts were verified from helicopter mapping done in 2009. Because this area of the park also has wide elevational and soil temperature gradients, a myriad of soils were mapped to cover the soil concepts. The wide range of soil temperature and corresponding vegetation communities is the reason this part of the park is unique. At the lowest elevations, coming out of the town of Desert Hot Springs (just west of the park and east of Highway I-10 in this image) on the alluvial fans is map unit 1527, which is dominated by the same young, active, sandy soils from the Pinto Basin Area (Pintobasin soils). Map unit 1250 is on the lowest elevations of mountainsides in the Little San Bernardino Mountains and is dominated by hot, very shallow and shallow, sandy-skeletal soils that lack soil development and by rock outcroppings of granitoid intermixed with gneissic rocks. Map unit 1260 has a higher base elevation than map unit 1250 and a wider elevational gradient. It is dominated by hot, moderately deep, sandy soils throughout but includes warm (thermic), moderately deep, sandy-skeletal soils on the north-facing slopes. Map units 3336, 3294, and 3293 are at the highest elevations in the park. The soils in these units have the coolest soil temperatures of soils within the Little San Bernardino Mountains and have the moistest soil moisture regime (Xeric Torriorthents and Smithcanyon soils). The vegetation that is correlated with these soils is common to the nearby San Bernardino Mountains and is not the common Mojave Desert species. As the elevational gradient drops towards the towns of Joshua Tree and Yucca Valley, south-facing slopes have Pinecity soils (this is the same map unit in image 1) that are similar to Smithcanyon soils because of their lack of soil development yet have warmer soil temperatures and are drier than Smithcanyon soils and Xeric Torriorthents. Within the northern end of the Little San Bernardino Mountains exist uplifted pediment surfaces covered by alluvially deposited soils with no soil development (Thunderclap soils) intermixed with soils on low hills that are very shallow to weathered bedrock (Smithcanyon soils). North of the Little San Bernardino Mountains are very deep alluvial soils that extend into the adjacent towns. These soils have some soil development on the more stable parts of the landscape (Jumborox soils) as well as thick, more recently deposited Morongo soils with little to no soil development. This image gives a clear overview of the Covington Flats area that was damaged by multiple fires in the 1990s and on the surrounding hills in 2006.



## Image 4

Image 4 shows an overview of the center of Joshua Tree National Park, looking southwest towards San Jacinto Peak. This section of the park lies within the areas shown in images 1 through 3. Image 4 covers the section of the park that is widely traveled, between the towns of Twentynine Palms and Indio. It includes one of the most iconic features of the park: the Cholla Cactus Gardens (map unit 1512). The Hexie Mountains are on the south (left side of the image) and the Pinto Mountains are on the north, both of which consist of the Pinto Gneiss Formation (right side of the image). At the lowest elevations, both mountain ranges have the same soils and map units (i.e., map unit 1225). At the higher elevations of the Hexie Mountains, the gneissic parent material has weathered into soils with argillic horizons over shallow or moderately deep weathered bedrock. The moister soils in these higher and cooler mountains areas have developed horizons with clay transformation. The eastern edge of the Hexie Mountains has soils dominated by granitoid with warm temperature regimes (map unit 4900). The western edge of Pinto Basin coming out of Wilson Canyon (the canyon in the middle of the mountains) has thick alluvial soils with little to no development for the most part (Pintobasin soils). The alluvial fan units protruding from the Pinto and Hexie Mountains (map units 1510, 1511, and 1512) are dominated by sandy-skeletal soils that contain high amounts of rock fragments moved both by alluvium and colluvium from the mountains above. Areas of stable landforms occur along the mountain fronts (map unit 1513) that contain soils (Rubylee soils) with significantly higher development than the surrounding soils. There are map units with a major component of eolian materials that have been deposited at the base of the Pinto Mountains and that formed both sand sheets and semi-stable sand dunes with Dalelake soils (maps unit 1530 and 2067, respectively). An obvious protusion of granitoid material is seen in this image and is identified as map unit 4830. Flat fan remnants with well developed soils make up map unit 4275. The delineation in the middle of the Hexie Mountains was mapped as such after reviewing photos taken from the helicopter work in 2009. Vegetation and landforms in the uplifted delineation were similar to those on the lower delineation of the map units along Pinkham Canyon Road

## **Image 5**

Image 5 shows the location of images 1 through 4 within Joshua Tree National Park.

## **Image 6**

Image 6 shows the major land resource areas (MLRAs) within Joshua Tree National Park.

# **NRCS Accessibility Statement**

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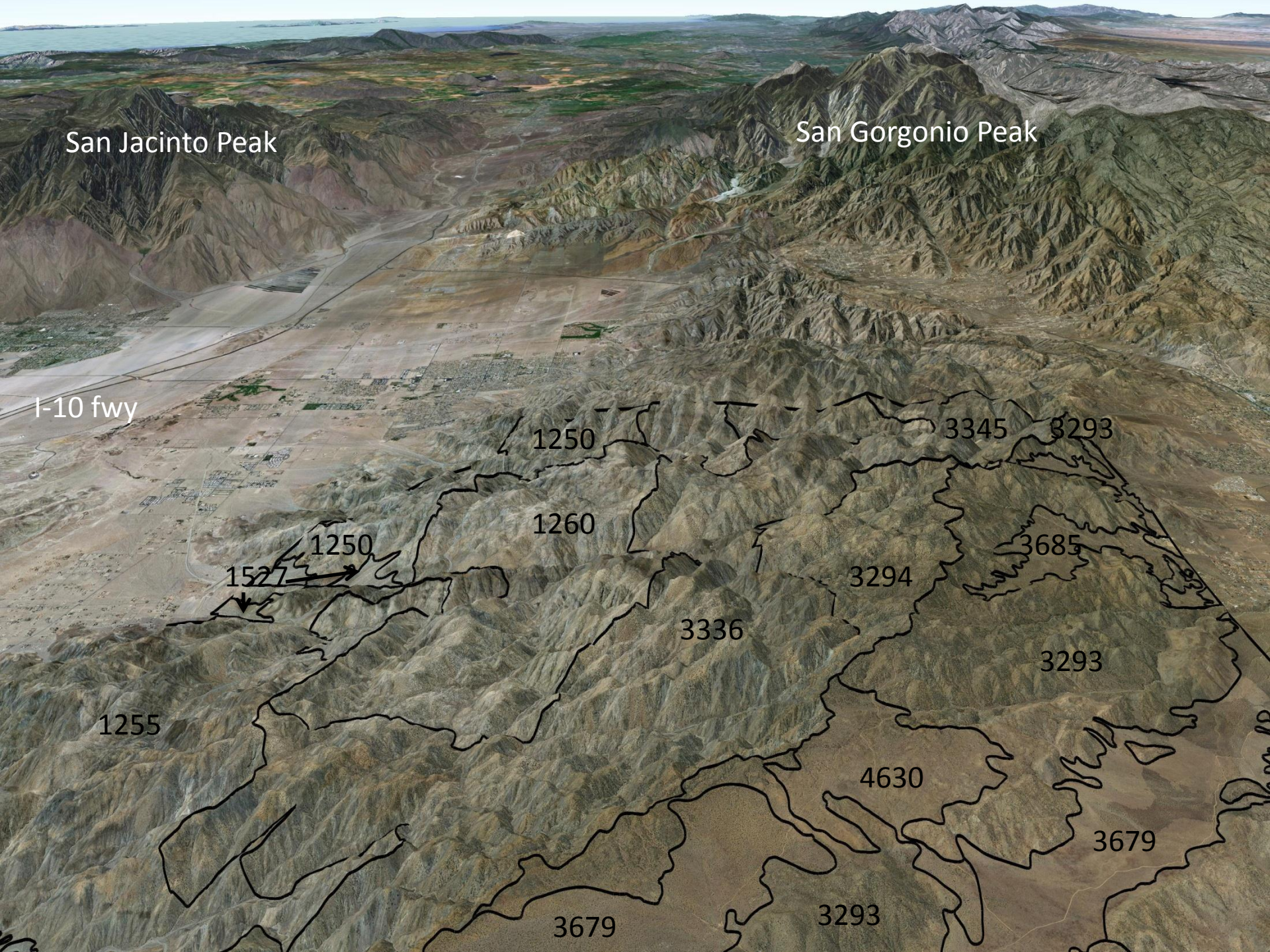












San Jacinto Peak

San Geronio Peak

I-10 fwy

1250

3345

3293

1260

1250

1527

3294

3685

3336

3293

1255

4630

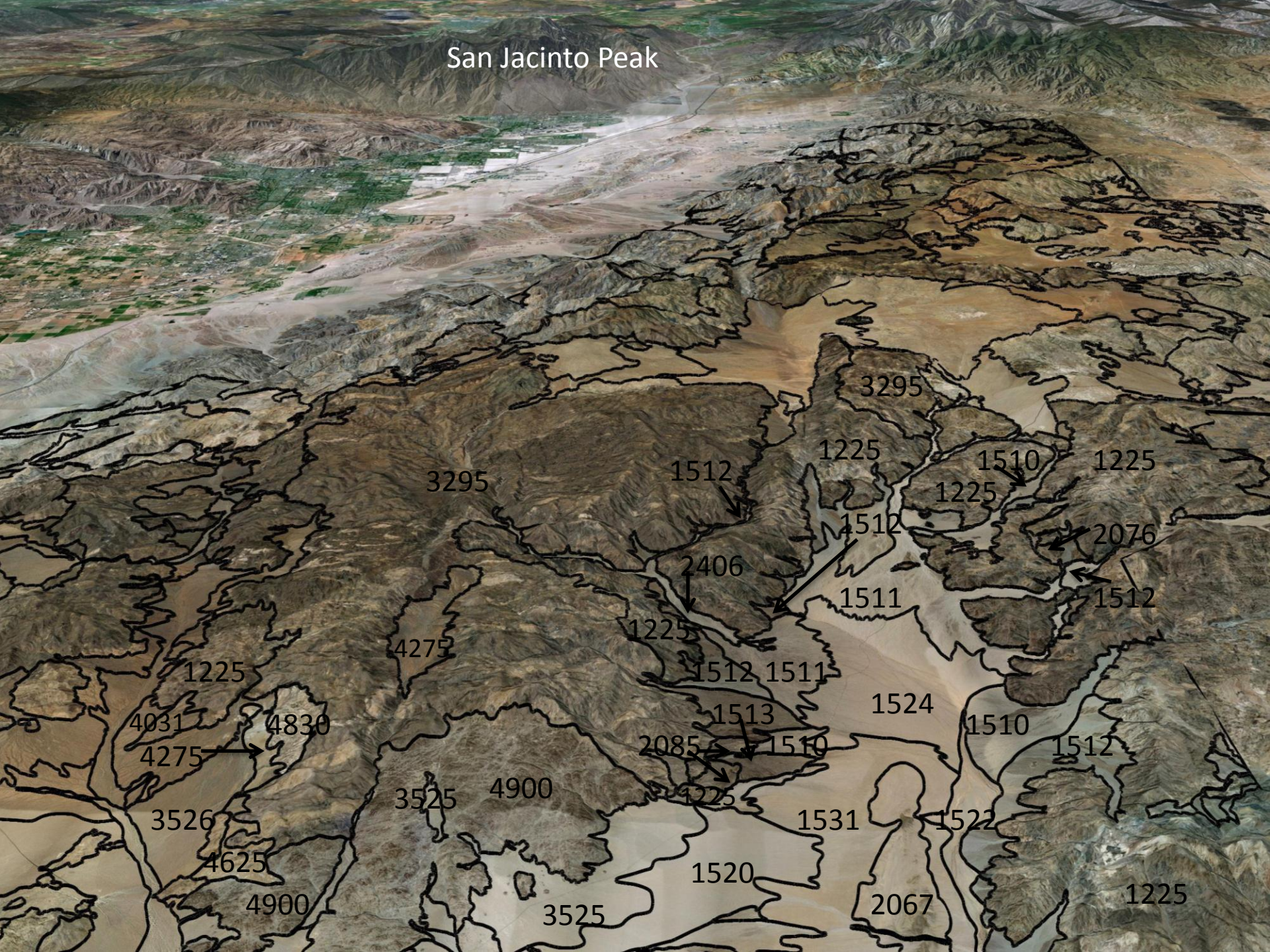
3679

3679

3293

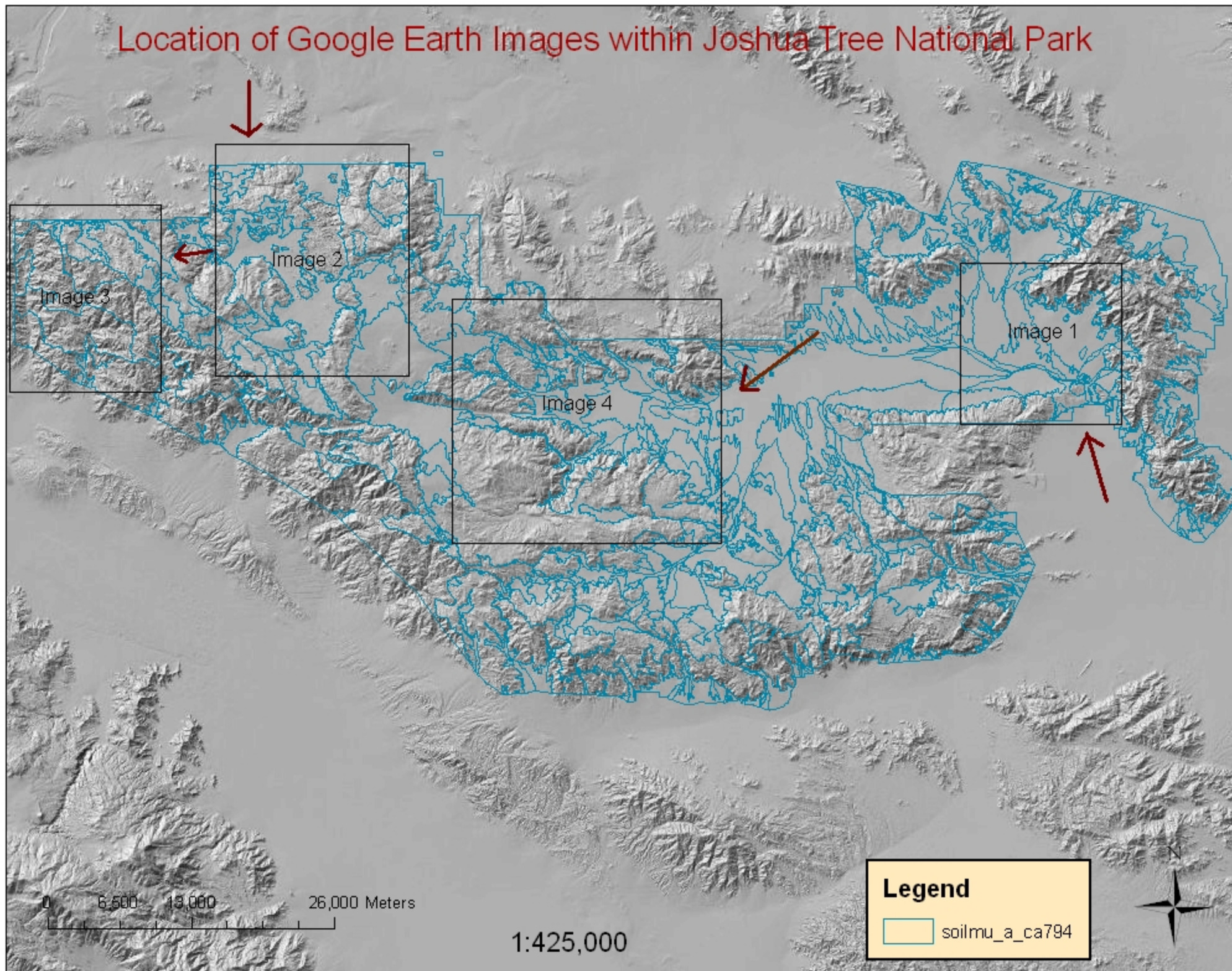


# San Jacinto Peak





# Location of Google Earth Images within Joshua Tree National Park





# MLRA boundaries within Joshua Tree National Park

## Legend

- MLRA
- soilmu\_a\_ca794

MLRA 30

MLRA 31

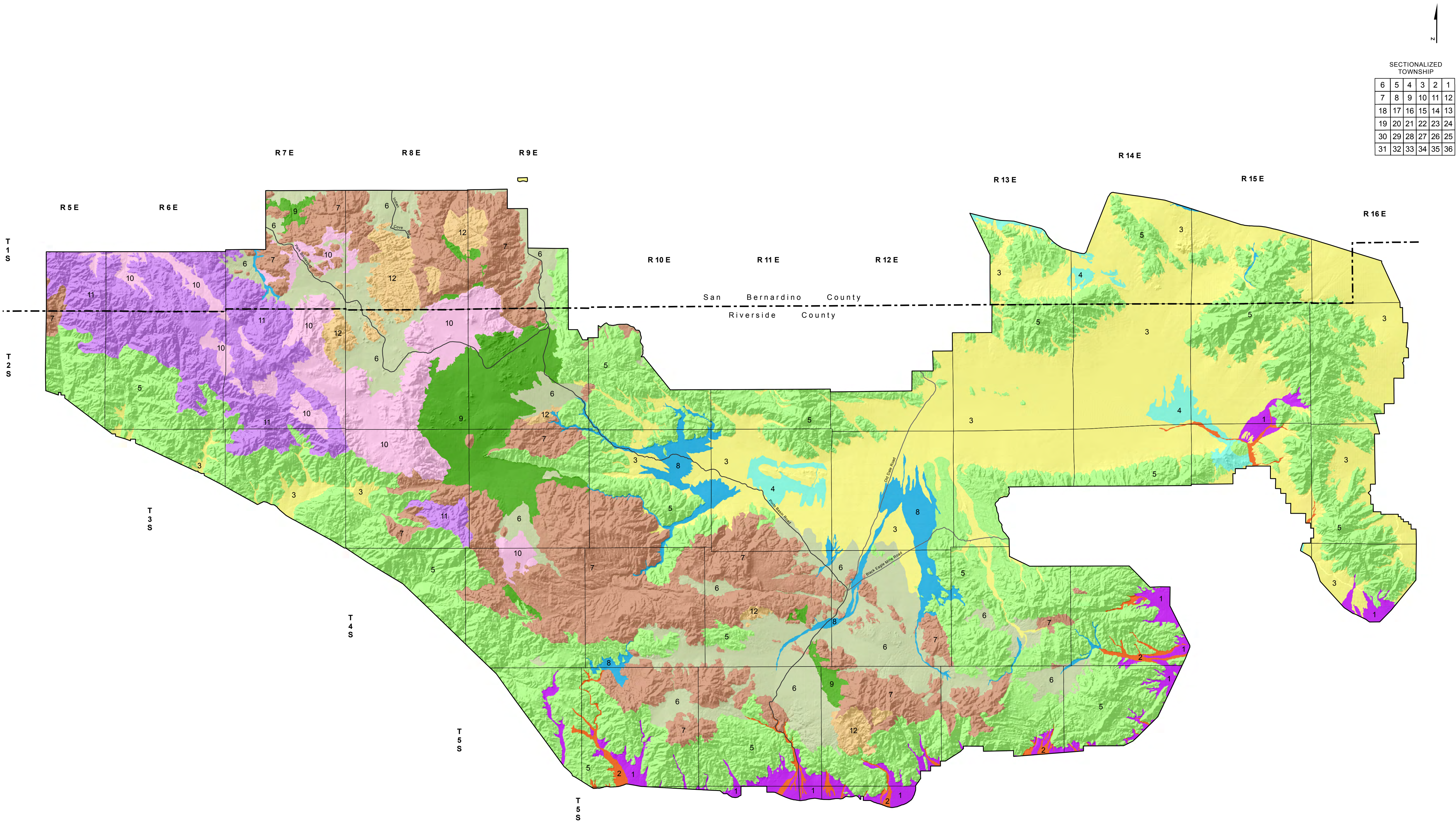
0 6,500 13,000 26,000 Meters

1:425,000





SECTIONALIZED TOWNSHIP					
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36



Legend

- 1

MLRA 31, Creosote bush and/or brittlebush, all slope Complex
- 2

MLRA 31, Ephemeral Streams Complex
- 3

Hyperthermic, Creosote bush and/or burrobush, low slope Complex
- 4

Hyperthermic, Creosote bush and/or big galleta, aeolian influence Complex
- 5

Hyperthermic, Creosote bush, burrobush and/or brittlebush, slope Complex
- 6

Thermic, Creosote bush and/or burrobush, low slope Complex
- 7

Thermic, Creosote bush and/or burrobush, slope Complex
- 8

MLRA 30, Ephemeral Streams Complex
- 9

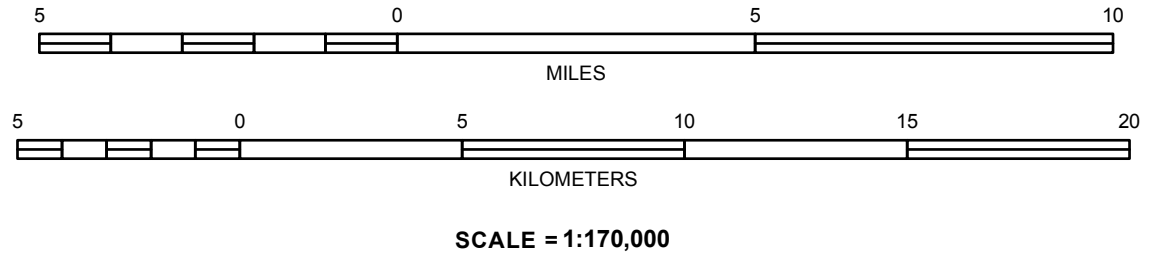
Thermic, Blackbrush with creosote bush and/or burrobush, low slope Complex
- 10

Cool-thermic, Blackbrush, California juniper and/or Joshua tree, all slope Complex
- 11

Aridic bordering on xeric Intergrade, California juniper-singleleaf pinyon, all slope Complex
- 12

Rock Outcrop - Singleleaf pinyon pine, Muller's oak, blackbrush Complex

GENERAL ECOLOGICAL SITES MAP  
JOSHUA TREE NATIONAL PARK  
CALIFORNIA





SECTIONALIZED TOWNSHIP					
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

T  
1  
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S

T  
5  
S

### Legend

#### Soils on Fan Piedmonts

##### Rizzo-Carsitas

**1** Very deep, sandy-skeletal or sandy soils that formed in alluvium from granitoid or gneissic rocks; on extreme hyperthermic, low-elevation alluvial fans, fan aprons and drainageways along the southern boundary of the park.

##### Dalelake-Pintobasin

**2** Very deep, eolian-deposited soils from granitoid and/or igneous sources intermixed with very deep, alluvial soils from granitoid and gneiss; on hyperthermic sand sheets interspersed with fan aprons in the northeast corner of the park and along the eastern edge of Pinto Basin.

##### Pintobasin-Carrizo

**3** Very deep, sandy and sandy-skeletal soils that formed in recent alluvium from granitoid and/or gneiss; on broad, hyperthermic fan aprons throughout the middle and eastern parts of the park.

##### Perurose-Carrizo-Oldale

**4** Moderately deep to very deep soils that formed in alluvium, including stable alluvium from granitoid and/or igneous rocks and active alluvium mainly from granitoid rocks; on stable hyperthermic fan remnants with root-restrictive layers and related, active inset fans and drainageways along the eastern edge of the park, especially in Pinto Basin.

##### Morongo-Cajon

**5** Very deep, sandy soils that formed in recent alluvium from granitoid; on broad, thermic fan aprons throughout most of the park.

##### Pinecity-Rock outcrop-Desertqueen

**6** Very shallow and shallow soils intermixed with large areas of rock outcrop; from granitoid or gneissic alluvium over granite rock or from granite residuum; on pediments in the northwestern portion of the park.

##### Bluecut-Morongo-Yuccabutte

**7** Very deep soils that formed in varying ages of alluvium from granitoid and gneiss; on stable fan remnants adjacent to more active younger fan aprons found mainly in the middle part of the park, including Pleasant Valley and Cottonwood Basin.

#### Soils on Hills and Mountains

##### Blackeagle-Rock outcrop

**8** Shallow to hard granitoid or gneissic bedrock among large areas of rock outcrop; on hyperthermic hills and mountains throughout the park, such as the lower elevations of the Hexie Mountains, the Pinto Mountains, and the Cottonwood Mountains.

##### Desertqueen-Pinecity-Rock outcrop

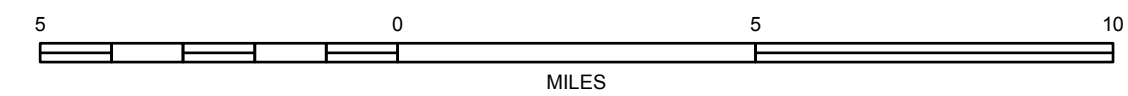
**9** Shallow, loamy and sandy soils that formed from granitoid and/or gneissic colluvium over residuum; on thermic mountains, hills, and associated pediments with typic-aridic soil moisture regimes in the middle and northwest portions of the park.

##### Smithcanyon-Xeric Torriorthents-Pinecity-Rock outcrop

**10** Dominantly very shallow and shallow, sandy soils that formed in colluvium and residuum from granitoid and/or gneissic bedrock; on thermic mountains at the highest elevations and along the most western edge of the park in areas that have the highest amounts of rainfall and an aridic bordering on xeric moisture regime, such as in the upper Little San Bernardinos.

UNITED STATES DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE  
MOJAVE DESERT RESOURCE CONSERVATION DISTRICT

## GENERAL SOIL MAP JOSHUA TREE NATIONAL PARK CALIFORNIA



SCALE = 1:170,000

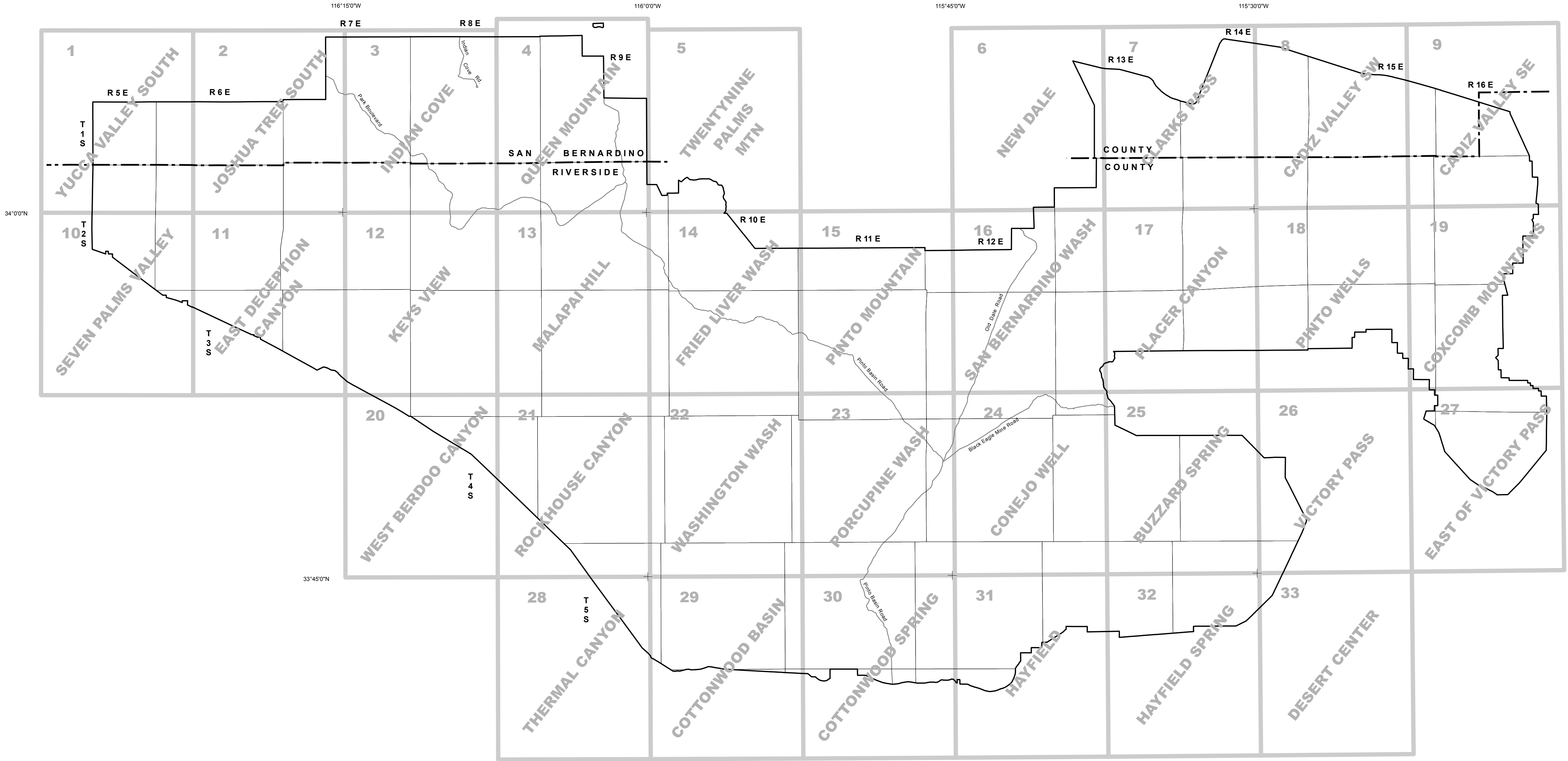
Each area outlined on the map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.





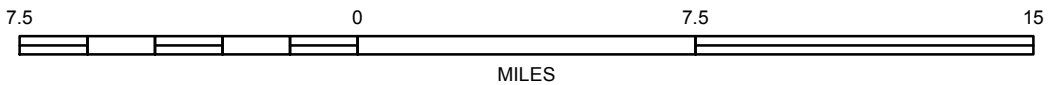
SECTIONALIZED  
TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36



INDEX TO MAP SHEETS

JOSHUA TREE NATIONAL PARK  
CALIFORNIA



SCALE = 1:185,000




SOIL LEGEND

SYMBOL	NAME
1220	Jadestorm-Blackeagle-Rock outcrop complex, 15 to 50 percent slopes
1225	Blackeagle-Rock outcrop complex, 15 to 75 percent slopes
1230	Jadestorm-Rock outcrop complex, 30 to 75 percent slopes
1240	Meccapass-Bulletproof-Rock outcrop complex, 30 to 75 percent slopes
1241	Meccapass-Seanna-Contactmine complex, 15 to 75 percent slopes
1242	Meccapass-Jadestorm-Rock outcrop complex, 15 to 75 percent slopes
1250	Ironlung-Rock outcrop complex, 30 to 75 percent slopes
1255	Goldenhills-Bulletproof-Fanhill-Whiterobe complex, 30 to 75 percent slopes
1260	Whiterobe-Bigbernie complex, 30 to 75 percent slopes
1410	Missionwell-Rock outcrop complex, 15 to 50 percent slopes
1415	Bolero-Rock outcrop complex, 30 to 75 percent slopes
1504	Rizzo association, 4 to 15 percent slopes, rubbly
1510	Carrizo very gravelly sandy loam, 2 to 4 percent slopes
1511	Carrizo complex, 2 to 8 percent slopes, flooded
1512	Carrizo extremely gravelly sandy loam, 2 to 8 percent slopes
1513	Carrizo-Rubylee complex, 1 to 4 percent slopes
1514	Carrizo-Pintobasin-Rubylee complex, 0 to 4 percent slopes
1515	Pintobasin-Carrizo complex, 2 to 8 percent slopes
1516	Pintobasin fine sandy loam, 0 to 2 percent slopes
1517	Pintobasin-Dalelake complex, 2 to 8 percent slopes
1520	Pintobasin loamy sand, 2 to 4 percent slopes
1522	Pintobasin gravelly sand, 1 to 3 percent slopes, rarely flooded
1523	Pintobasin-Aquapeak association, 2 to 4 percent slopes
1524	Pintobasin sand, 0 to 2 percent slopes
1525	Pintobasin complex, 2 to 4 percent slopes, flooded
1526	Pintobasin-Joetree-Patscamp complex, 2 to 8 percent slopes
1527	Pintobasin loamy sand, 4 to 15 percent slopes
1530	Dalelake fine sand, 0 to 4 percent slopes
1531	Dalelake-Pintobasin complex, 0 to 4 percent slopes
1540	Carrizo-Russiroks complex, 2 to 8 percent slopes
1541	Carrizo-Cambidic Haplodurids association, 4 to 15 percent slopes
1542	Carrizo complex, 4 to 15 percent slopes
1550	Buzzardsprings-Coxpin-Dalelake complex, 2 to 8 percent slopes
1555	Goldrose-Carsitas-Chemwash complex, 4 to 8 percent slopes
2003	Emptygun very gravelly loamy sand, 15 to 50 percent slopes
2060	Joetree-Dalelake-Pintobasin complex, 0 to 2 percent slopes
2065	Dalelake-Aquapeak-Coxpin association, 2 to 8 percent slopes
2067	Aquapeak-Buzzardsprings-Dalelake complex, 2 to 30 percent slopes
2068	Aquapeak-Carpetflat-Pintobasin complex, 0 to 4 percent slopes
2070	Missionsweet-Carpetflat association, 2 to 30 percent slopes
2075	Oldale-Missionsweet association, 0 to 15 percent slopes
2076	Oldale-Carrizo complex, 2 to 8 percent slopes
2077	Oldale-Carrizo association, 0 to 8 percent slopes
2085	Rainbowsend-Goldenbell complex, 4 to 50 percent slopes
2090	Deprave-Rockhound-Rizzo complex, 2 to 4 percent slopes
2091	Deprave-Roostertail association, 0 to 4 percent slopes
2100	Perurose-Coxpin-Pintobasin association, 2 to 15 percent slopes
2101	Perurose-Pintobasin complex, 2 to 8 percent slopes
2110	Descent association, 4 to 50 percent slopes
2111	Descent-Rubylee association, 8 to 50 percent slopes
2120	Rizzo-Deprave complex, 2 to 8 percent slopes
2121	Rizzo very cobbly coarse sandy loam, 4 to 15 percent slopes, rubbly
2130	Goldenbell-Descent association, 2 to 15 percent slopes
2140	Rockhound extremely gravelly loam, 4 to 15 percent slopes
2402	Rizzo complex, 2 to 8 percent slopes
2403	Rizzo-Rizzo, occasionally flooded complex, 2 to 8 percent slopes
2404	Rizzo complex, 2 to 8 percent slopes, channeled
2405	Carrizo complex, 0 to 4 percent slopes
2406	Pintobasin-Carrizo association, 2 to 8 percent slopes, flooded
2407	Pintobasin-Carrizo association, 2 to 4 percent slopes
2408	Rizzo complex, 2 to 8 percent slopes, flooded
2409	Rizzo-Chemwash-Carsitas complex, 4 to 8 percent slopes
2420	Carsitas complex, 0 to 4 percent slopes
2421	Carsitas complex, 4 to 8 percent slopes
2431	Chemwash complex, 4 to 8 percent slopes
2440	Rizzo complex, 8 to 15 percent slopes
2715	Dalelake-Sheephole-Pintobasin complex, 2 to 8 percent slopes
2716	Dalelake complex, 4 to 30 percent slopes
2717	Dalelake-Rock outcrop-Buzzardsprings association, 4 to 30 percent slopes
2718	Dalelake-Sheephole complex, 2 to 4 percent slopes
2820	Rock outcrop-Impedimenta complex, 4 to 30 percent slopes

SYMBOL	NAME
2825	Rock outcrop-Supplymine-Bolero-Ironage complex, 15 to 60 percent slopes
2830	Rock outcrop-Blackeagle complex, 30 to 75 percent slopes, dry
2835	Rock outcrop-Blackeagle complex, 30 to 75 percent slopes
2840	Rock outcrop-Jadestorm complex, 30 to 60 percent slopes
3110	Coppermine-Stranger complex, 8 to 50 percent slopes
3120	Aguilareal-Blackeagle-Rock outcrop complex, 30 to 60 percent slopes
3213	Dalvord-Aguilareal-Rock outcrop complex, 15 to 60 percent slopes
3242	Langwell-Rock outcrop-Helendale complex, 4 to 30 percent slopes
3285	Pinecity-Contactmine-Desertqueen-Rock outcrop association, 30 to 50 percent slopes
3286	Pinecity gravelly loamy sand, 30 to 60 percent slopes
3291	Smithcanyon-Stubbespring-Rock outcrop complex, 15 to 50 percent slopes
3292	Smithcanyon-Pinecity-Rock outcrop association, 15 to 50 percent slopes
3293	Smithcanyon-Pinecity association, 15 to 50 percent slopes
3294	Smithcanyon gravelly sand, 30 to 75 percent slopes
3295	Desertqueen-Hexie-Rock outcrop complex, 15 to 50 percent slopes
3296	Desertqueen-Pinecity complex, 15 to 50 percent slopes
3297	Desertqueen-Contactmine-Seanna complex, 8 to 30 percent slopes
3325	Ironped-Rock outcrop-Hexie complex, 30 to 60 percent slopes
3335	Xeric Torriorthents-Rock outcrop association, 15 to 75 percent slopes
3336	Xeric Torriorthents-Bigbernie association, 30 to 75 percent slopes
3340	Seanna-Grubstake-Pinecity complex, 30 to 75 percent slopes
3345	Bigcanyon association, 30 to 75 percent slopes
3440	Pacific Mesa complex, 8 to 50 percent slopes
3509	Cajon-Friedliver complex, 2 to 8 percent slopes, moist
3525	Cajon-Friedliver complex, 2 to 8 percent slopes
3526	Cajon-Hypoint-Arizo association, 1 to 4 percent slopes
3611	Burntshack association, 2 to 15 percent slopes
3612	Burntshack association, 2 to 4 percent slopes
3676	Morongo loamy sand, 2 to 4 percent slopes
3677	Morongo sand, 2 to 4 percent slopes
3679	Morongo-Jumborox complex, 2 to 8 percent slopes
3680	Morongo loamy sand, 2 to 8 percent slopes, dry
3681	Morongo-Jumborox complex, 4 to 8 percent slopes, warm
3682	Morongo-Jumborox-Urban land complex, 4 to 8 percent slopes
3683	Morongo-Bluecut association, 2 to 8 percent slopes
3684	Morongo loamy sand, 4 to 8 percent slopes, warm
3685	Morongo-Desertqueen complex, 8 to 30 percent slopes
3690	Nasagold gravelly loamy sand, 2 to 4 percent slopes
3695	Gocougs loamy coarse sand, 2 to 8 percent slopes
4031	Crosgrain-Crackerjack-Pinkcan complex, 4 to 30 percent slopes
4041	Silvermine-Helendale-Burntshack association, 1 to 15 percent slopes
4064	Gravesumit-Helendale complex, 1 to 4 percent slopes
4071	Helendale-Desertqueen association, 4 to 15 percent slopes
4091	Littlefargo-Rock outcrop association, 4 to 15 percent slopes
4245	Bluecut-Morongo-Yander association, 2 to 8 percent slopes
4260	Minhoyt-Corbilt association, 2 to 8 percent slopes
4265	Werewolf gravelly sandy loam, 4 to 15 percent slopes
4270	Yuccabutte very gravelly loam, 8 to 50 percent slopes
4271	Yuccabutte-Arizo association, 2 to 15 percent slopes
4275	Pinkcan-Werewolf-Gocougs association, 2 to 8 percent slopes
4280	Mekkadale-Edalph association, 4 to 30 percent slopes
4285	Typic Argidurids-Coppermine-Minhoyt complex, 4 to 30 percent slopes
4403	Arizo complex, 2 to 8 percent slopes
4440	Dragonwash association, 2 to 4 percent slopes
4450	Morongo association, 2 to 4 percent slopes
4605	Pinecity loamy sand, 2 to 8 percent slopes
4606	Pinecity-Rock outcrop association, 4 to 15 percent slopes
4607	Pinecity sand, 4 to 8 percent slopes
4608	Pinecity-Rock outcrop association, 4 to 15 percent slopes, high elevation
4610	Desertqueen-Jumborox-Rock outcrop association, 2 to 8 percent slopes, warm
4615	Desertqueen-Jumborox-Rock outcrop association, 2 to 15 percent slopes
4620	Stranger-Rock outcrop-Grubstake complex, 8 to 50 percent slopes
4625	Grinder-Pinkcan complex, 4 to 30 percent slopes
4630	Thunderclap-Smithcanyon complex, 4 to 15 percent slopes
4804	Rock outcrop-Ironped-Pinecity association, 30 to 60 percent slopes
4805	Rock outcrop-Ironped association, 8 to 15 percent slopes
4806	Rock outcrop
4811	Rock outcrop-Pioneertown association, 30 to 60 percent slopes, dry
4825	Rock outcrop-Grubstake-Cajon-Stranger association, 2 to 15 percent slopes
4830	Rock outcrop-Pinecity complex, 8 to 30 percent slopes
4900	Rock outcrop-Aguilareal-Lostpalms complex, 8 to 50 percent slopes

CONVENTIONAL AND SPECIAL  
SYMBOLS LEGEND

SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS	
Rock outcrop	
AD HOC SOIL SYMBOLS	
Oasis	



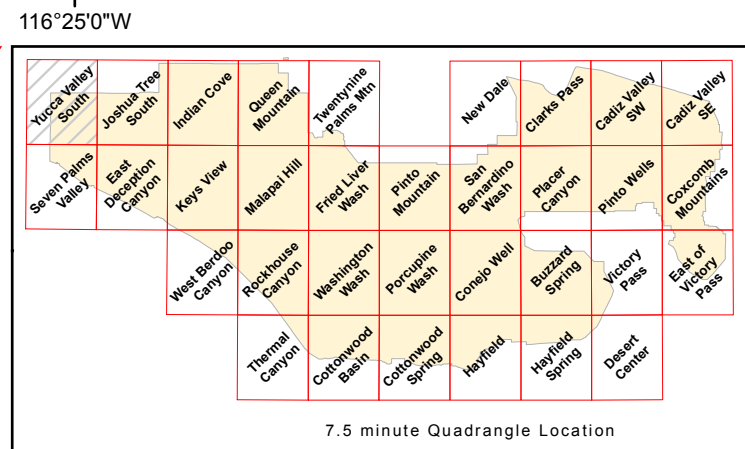
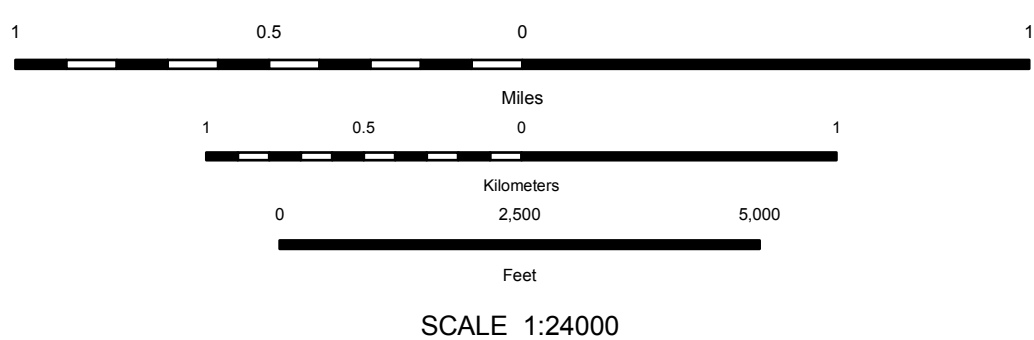


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Joins Sheet 2, Joshua Tree South

Joins Sheet 10, Seven Palms Valley

Joins Sheet 11, East Joshua Canyon



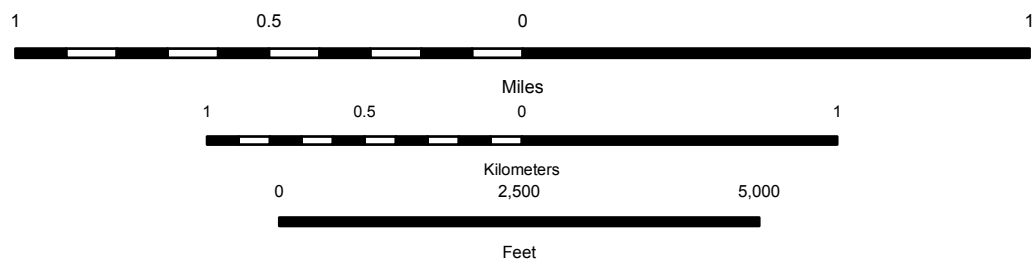


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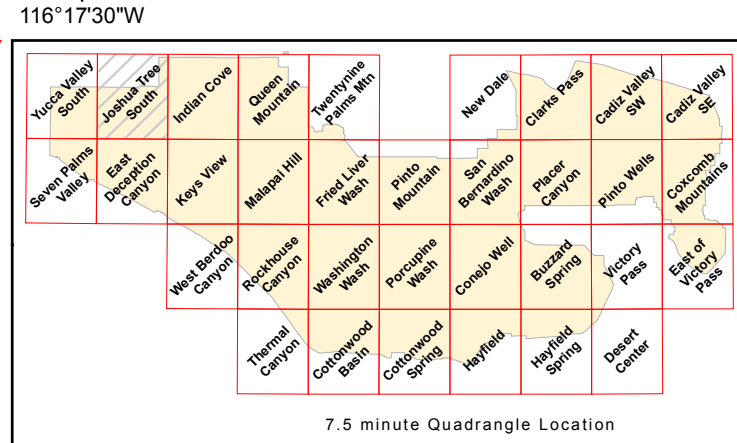
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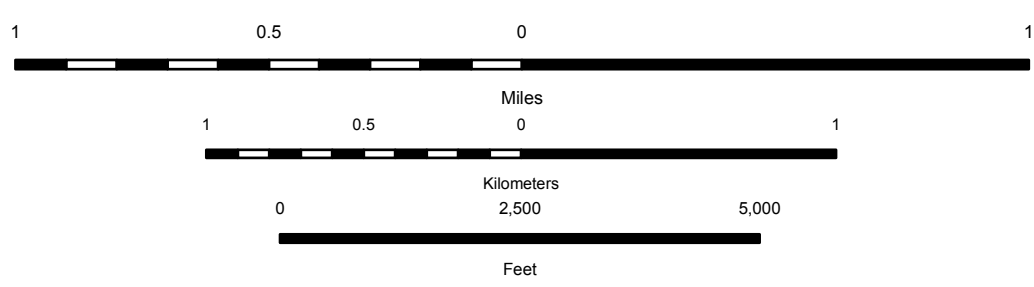


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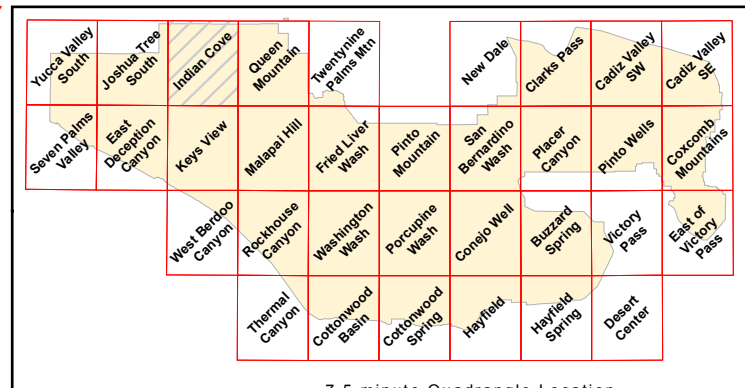
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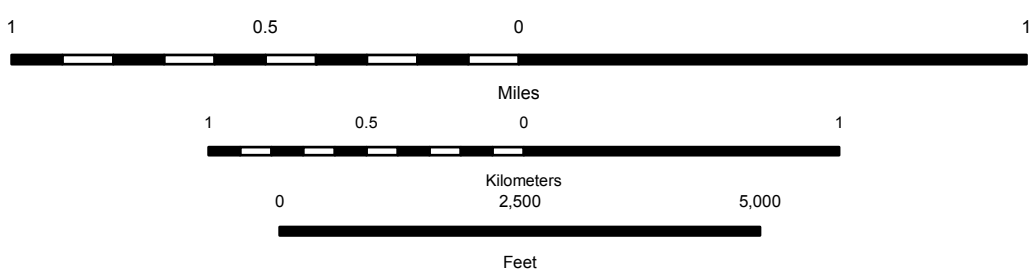


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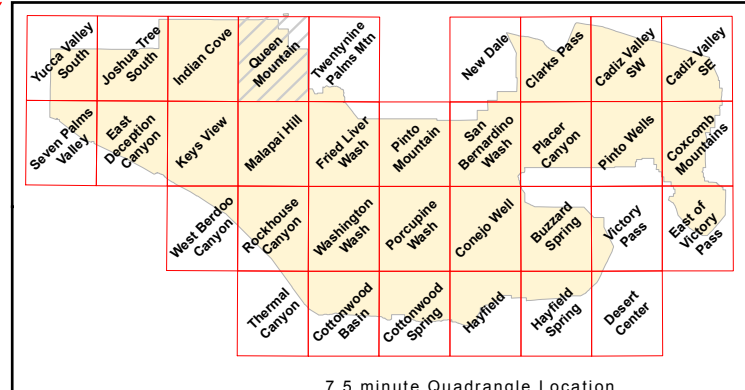
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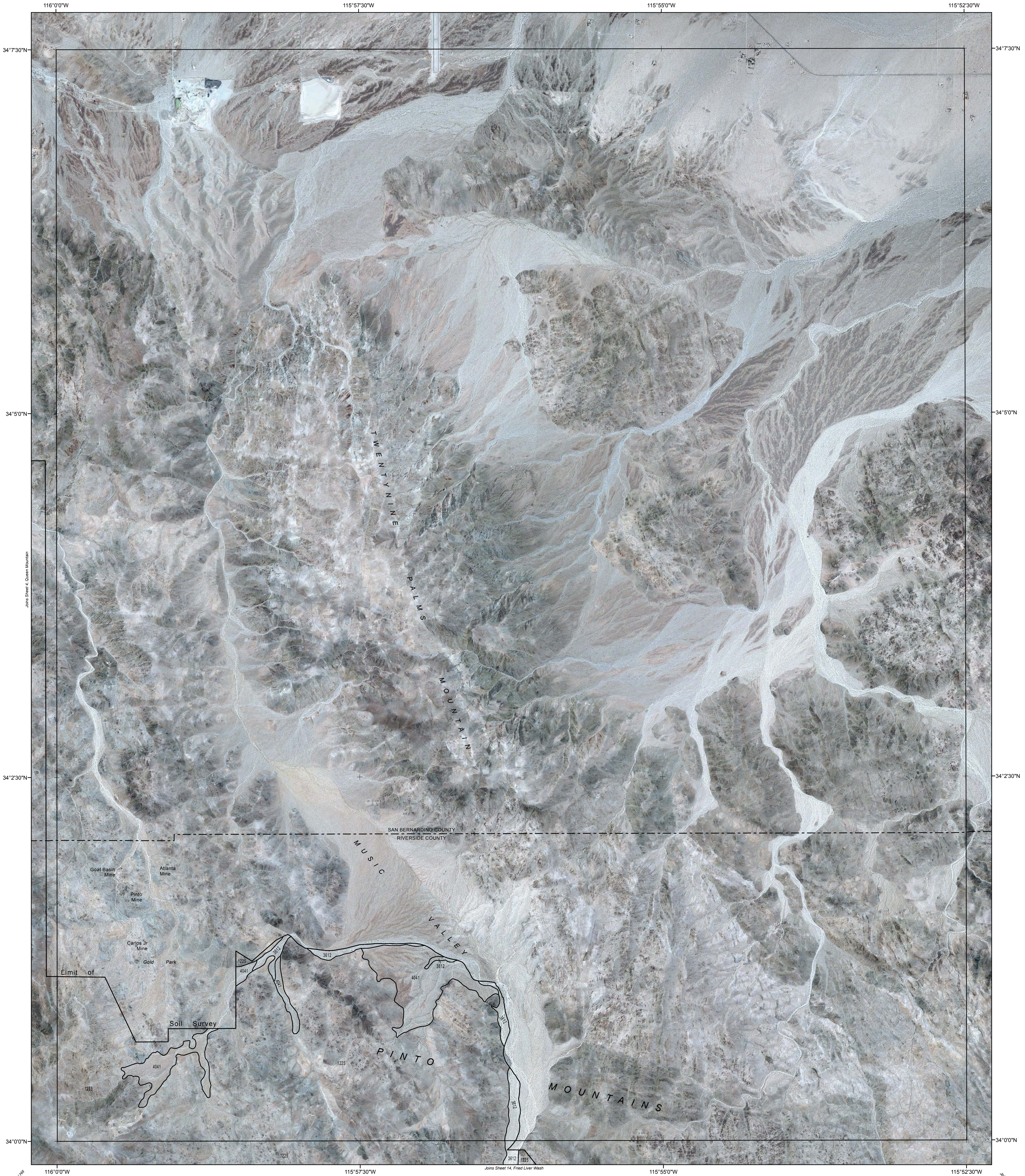
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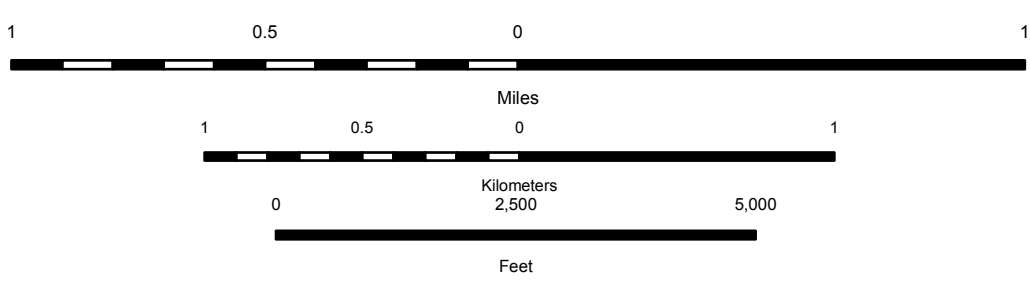


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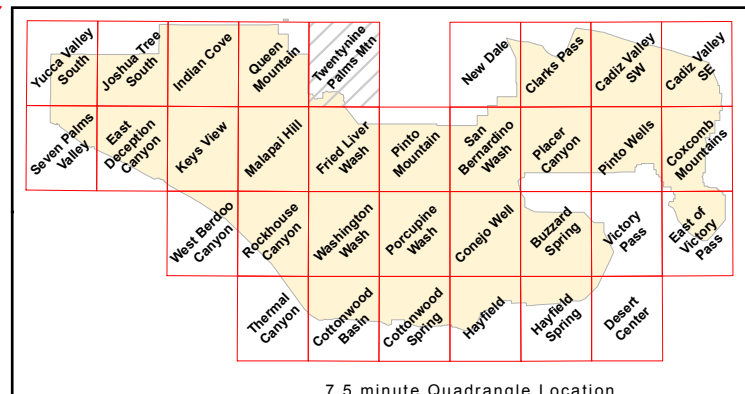
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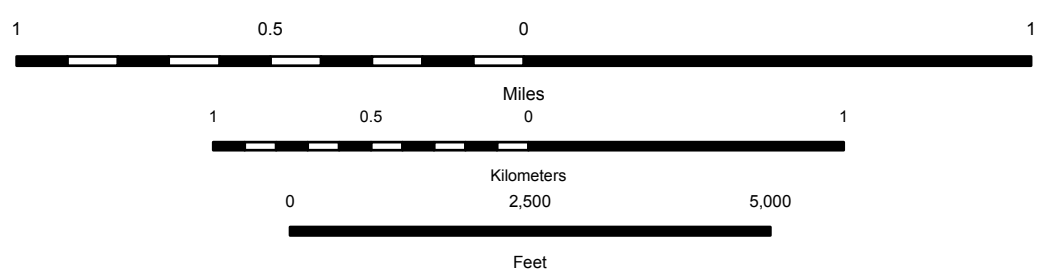
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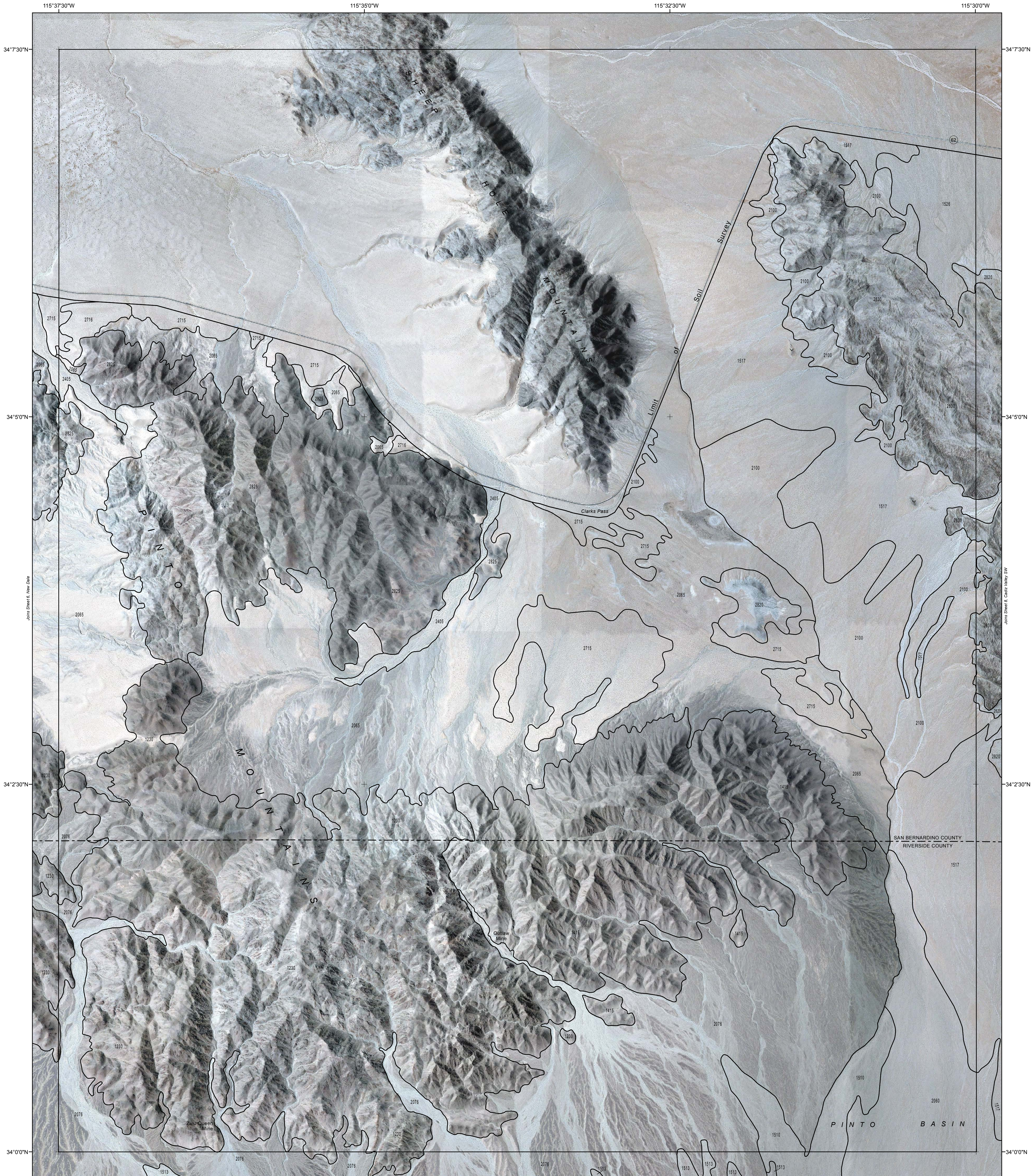




Joshua Tree National Park, Location





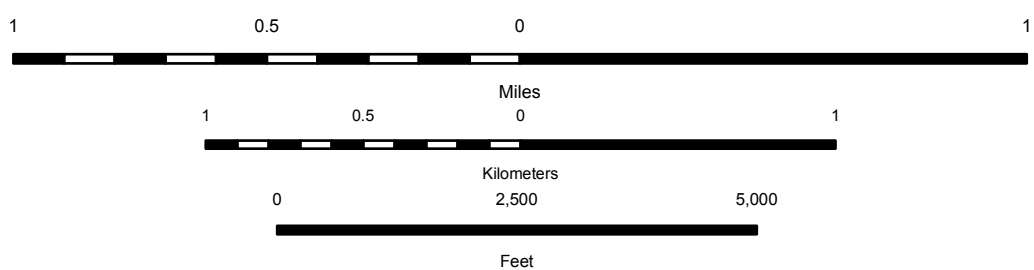


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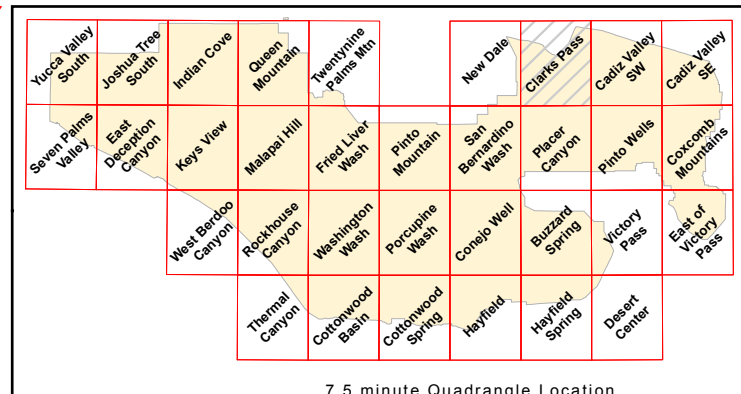
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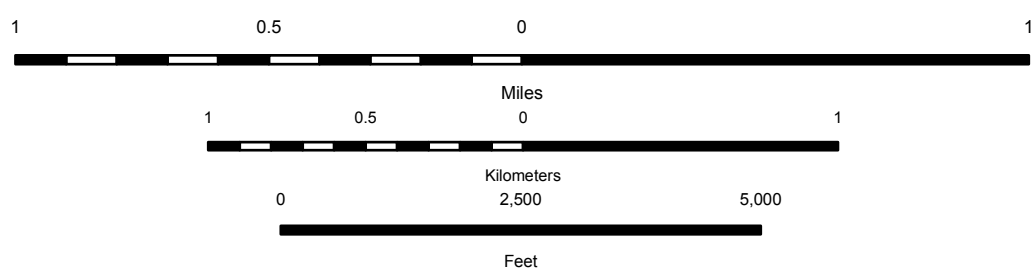
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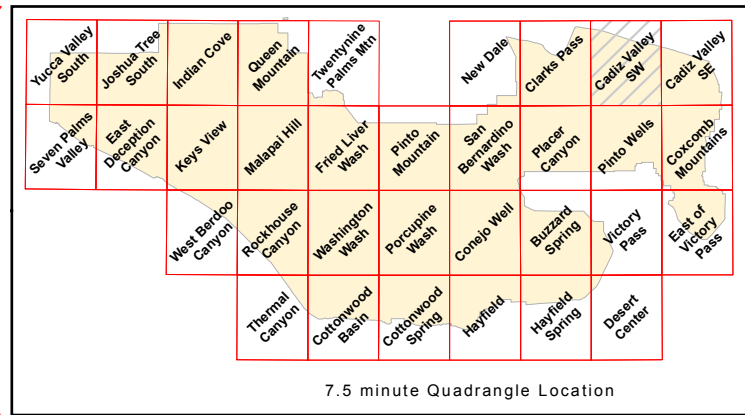
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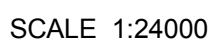




Joshua Tree National Park.  
Location







Joshua Tree National Park. Location





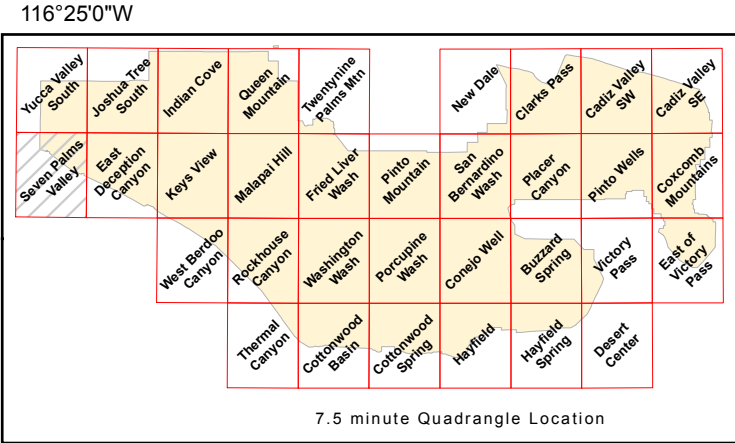
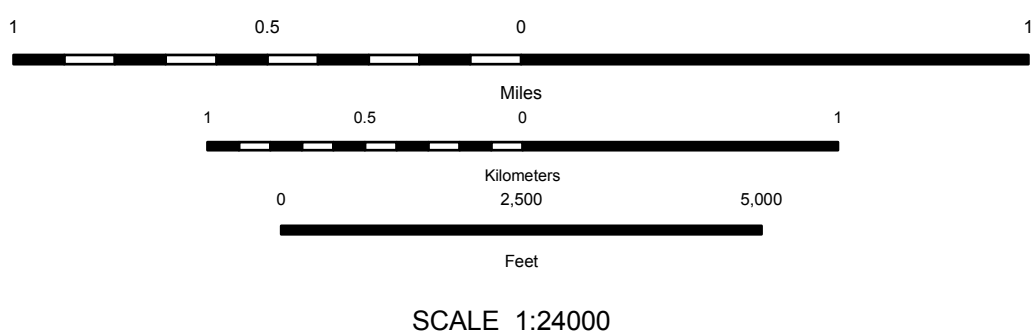


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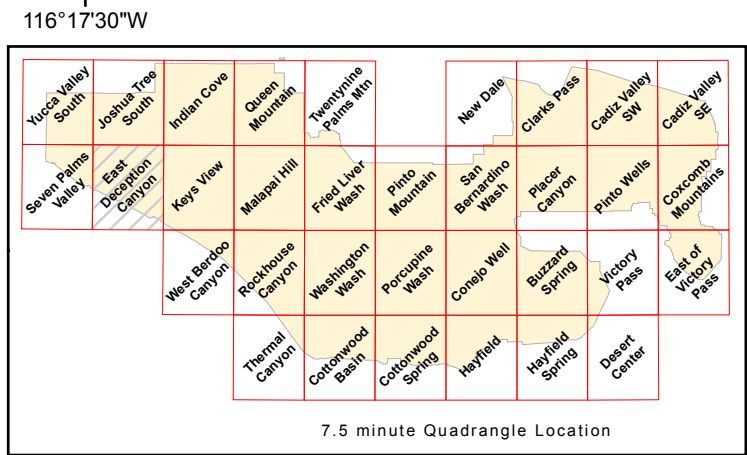






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- Miles:** The top line is labeled "Miles" and has tick marks at 0, 0.5, and 1.
- Kilometers:** The middle line is labeled "Kilometers" and has tick marks at 0, 0.5, and 1.
- Feet:** The bottom line is labeled "Feet" and has tick marks at 0, 2,500, and 5,000.





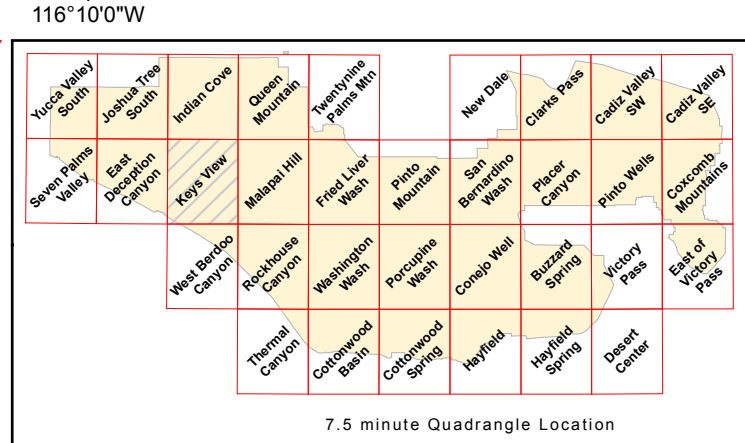
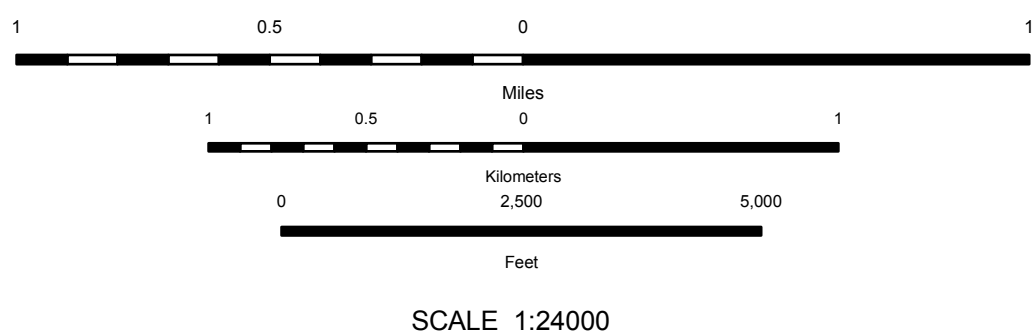


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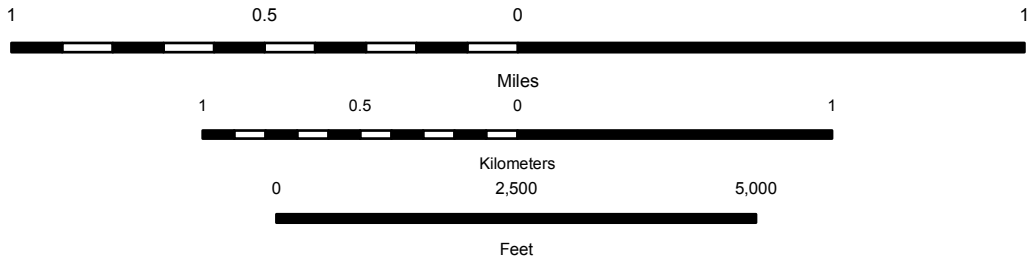


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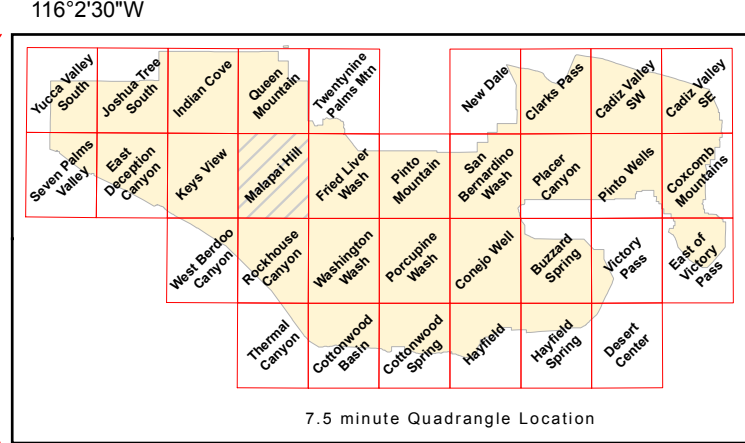
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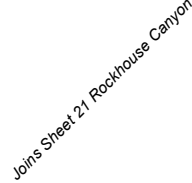
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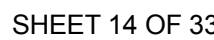
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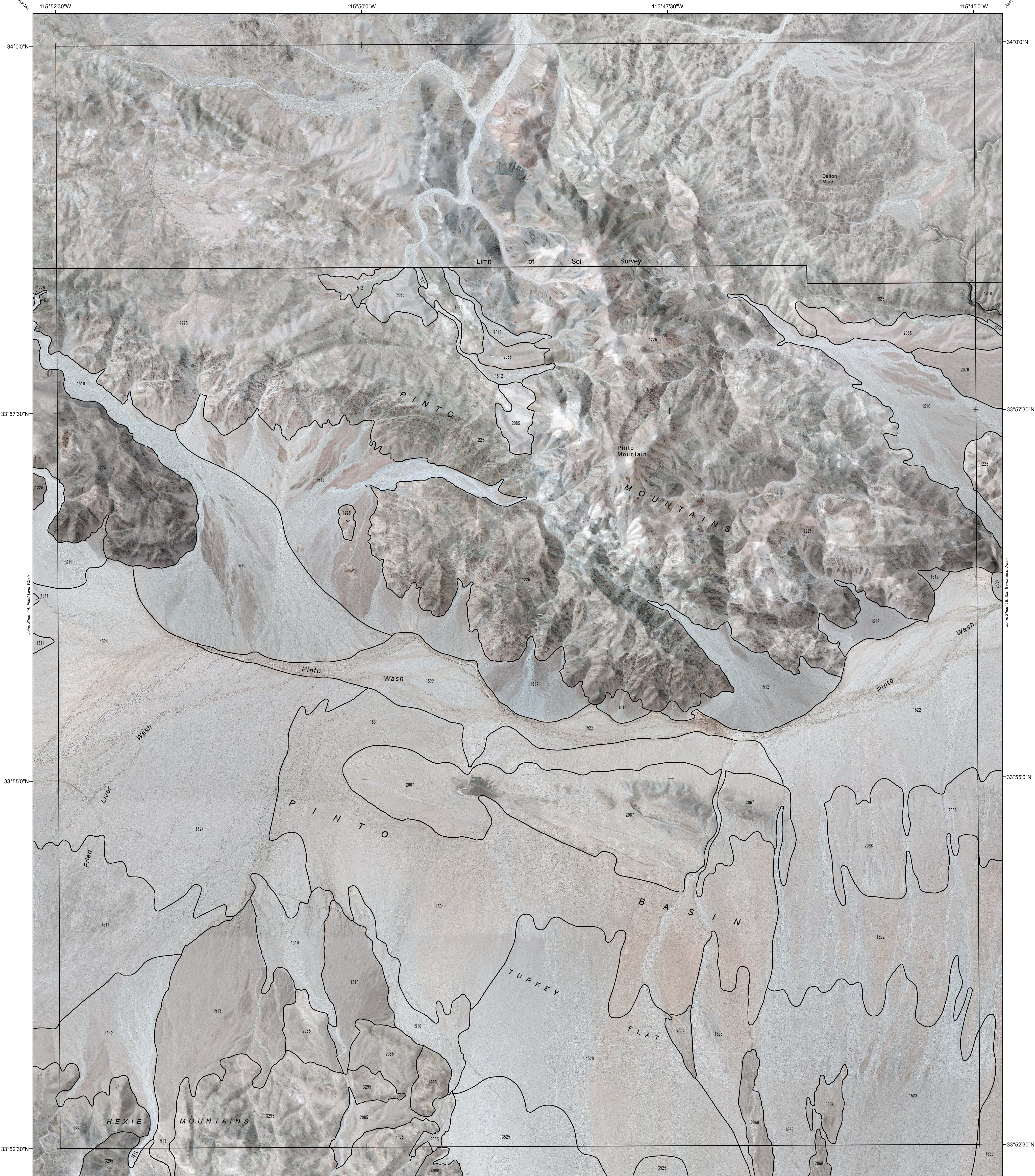




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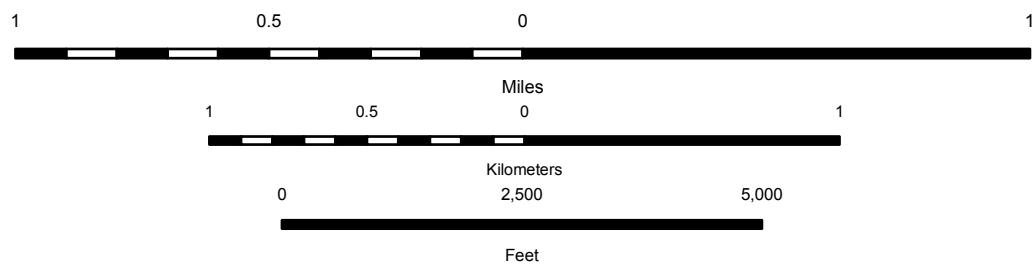


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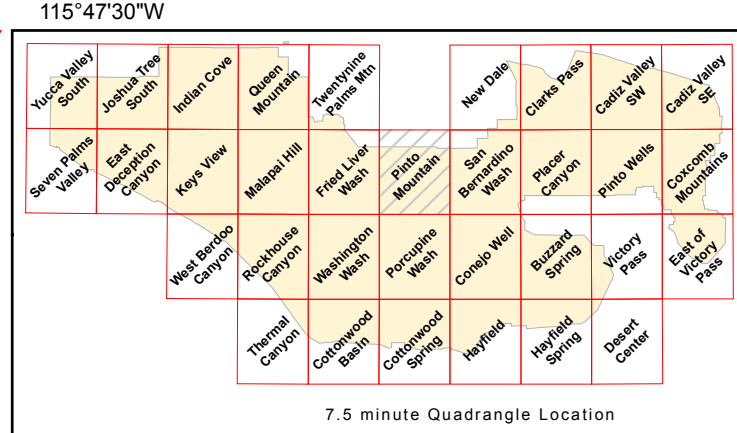
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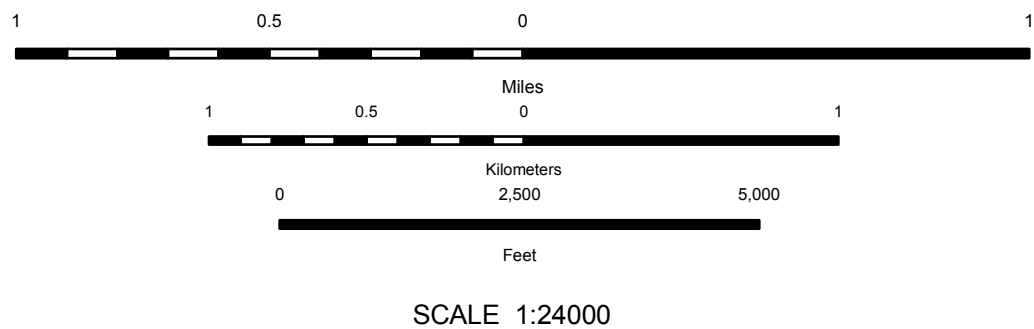


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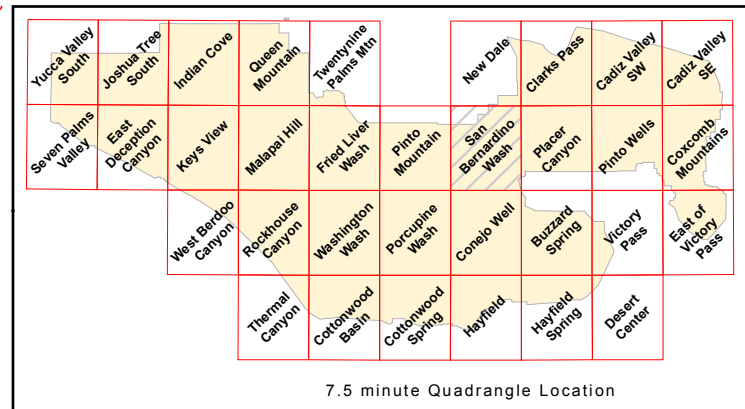
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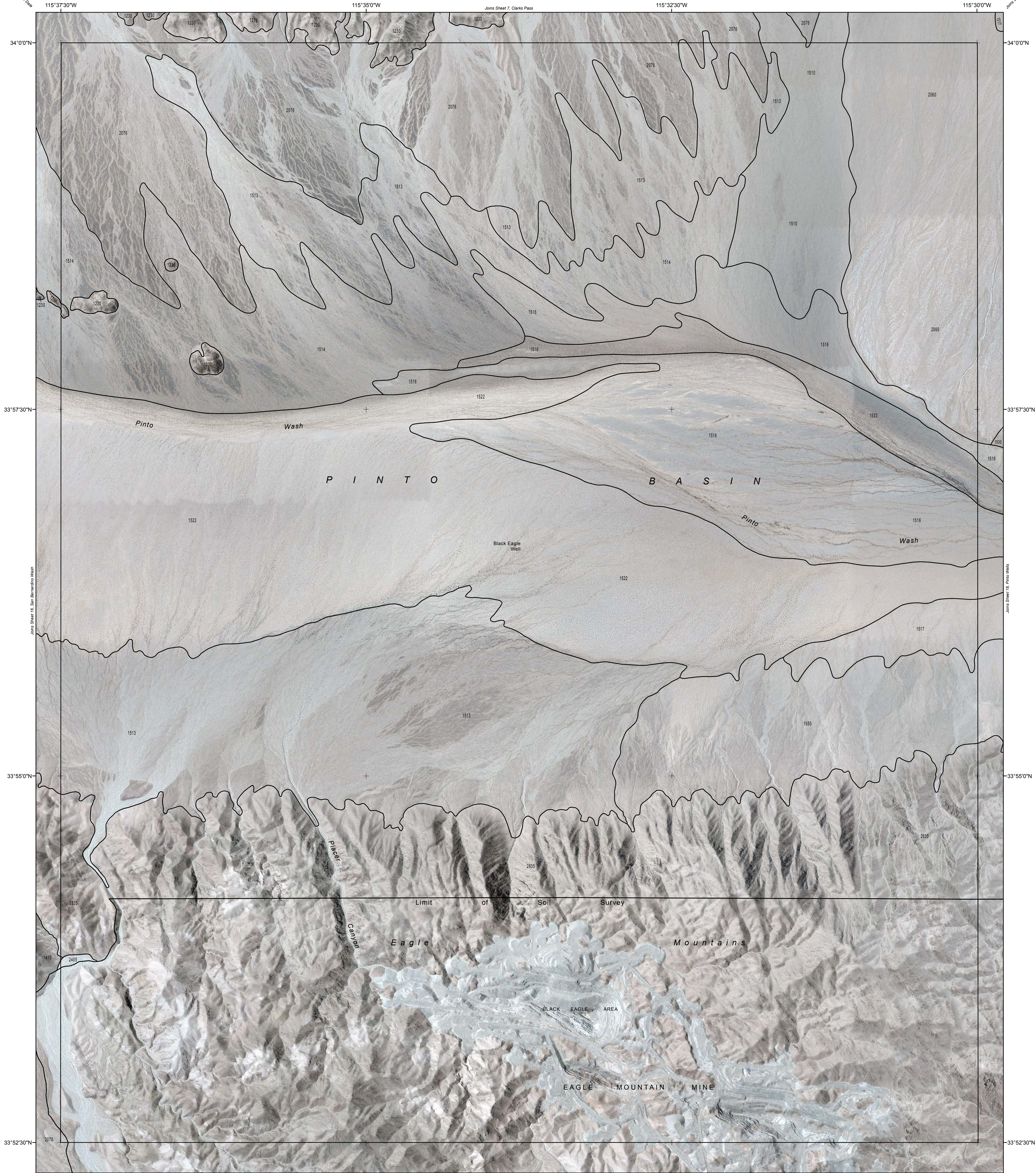
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Joshua Tree National Park  
Location





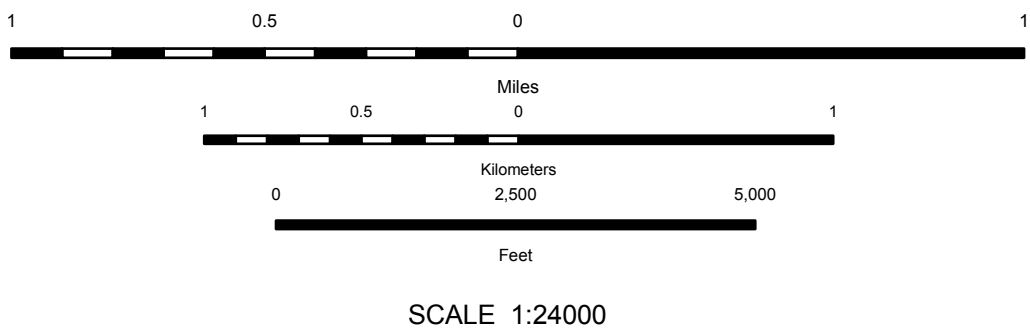


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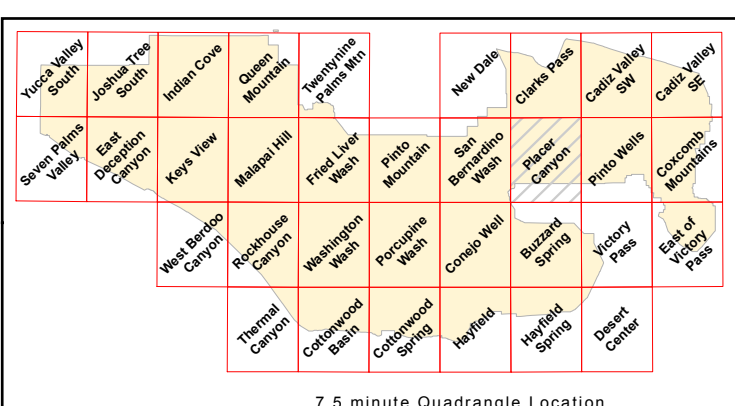
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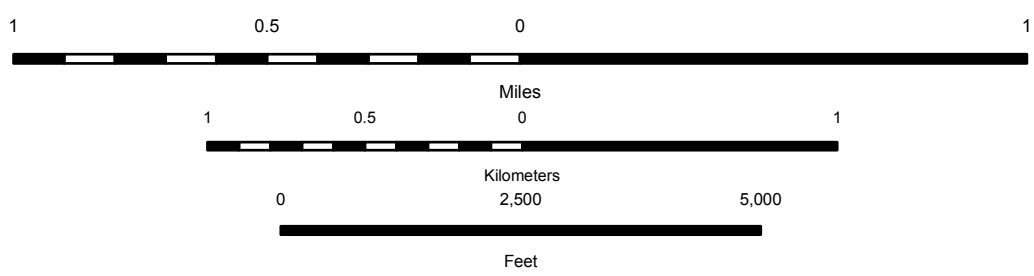
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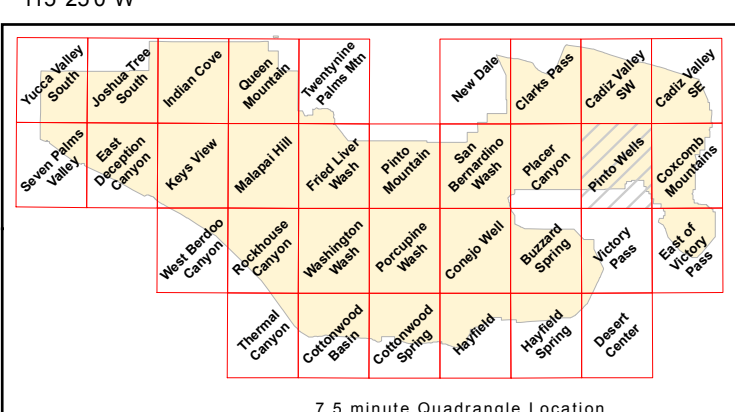
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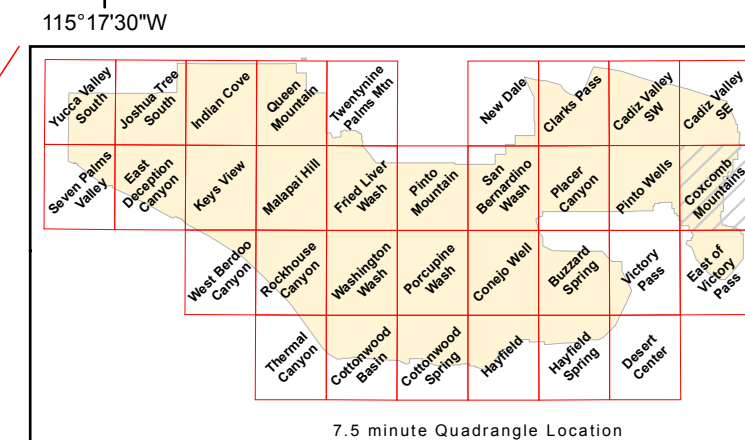
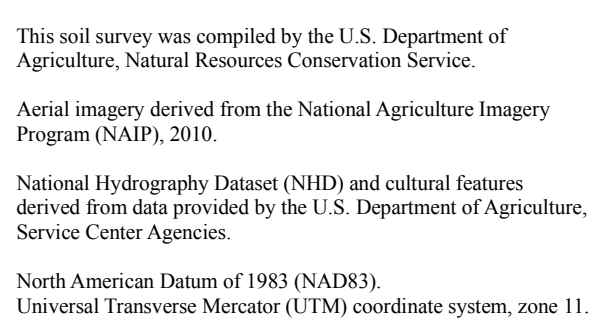




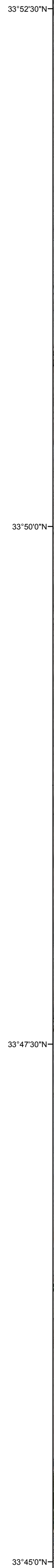
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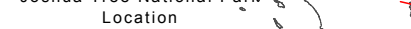
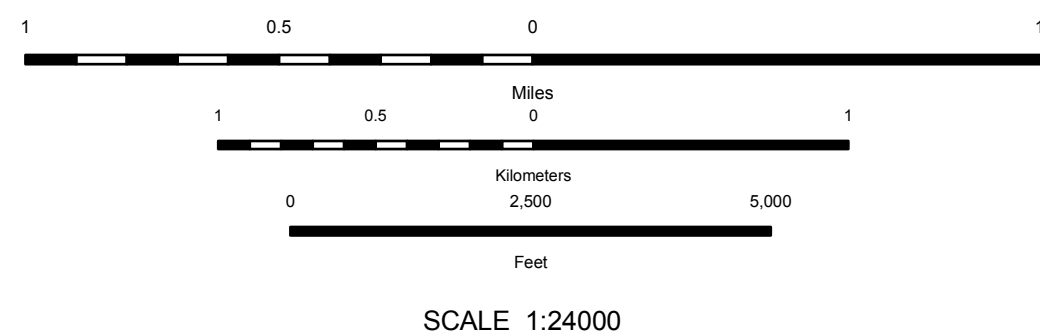








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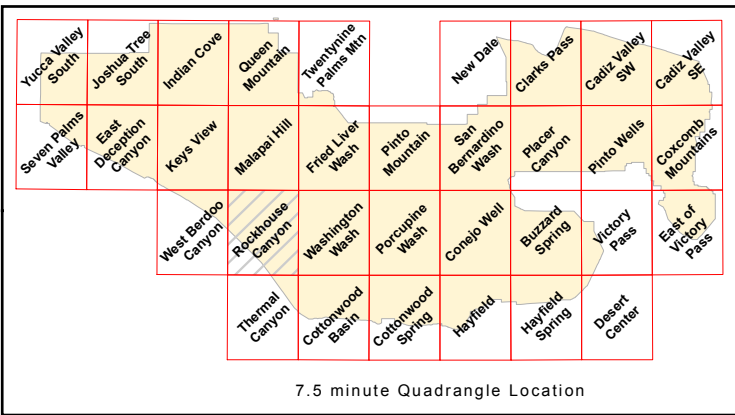
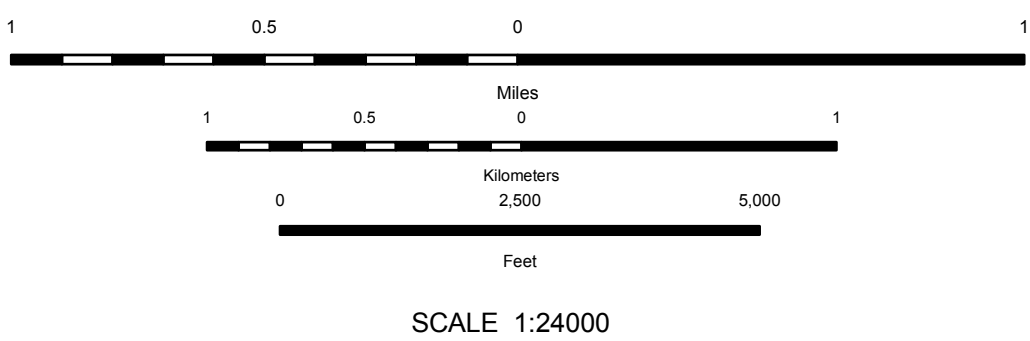


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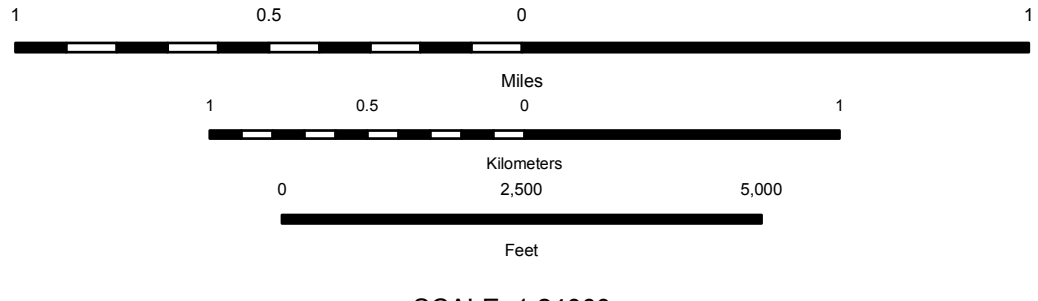


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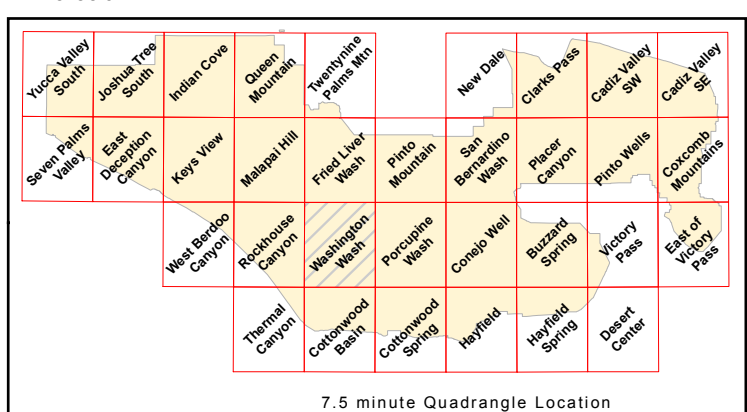
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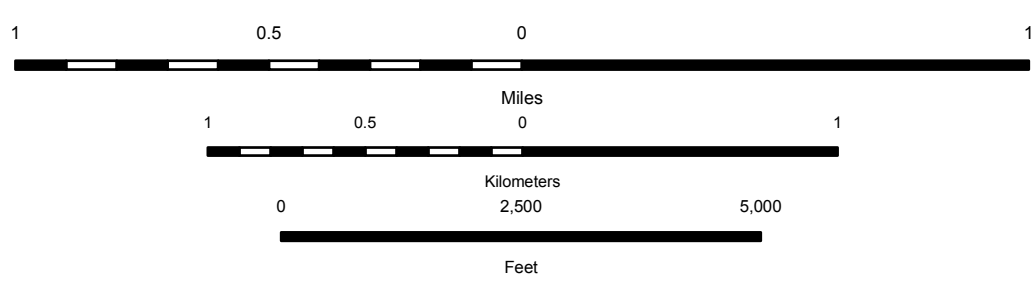


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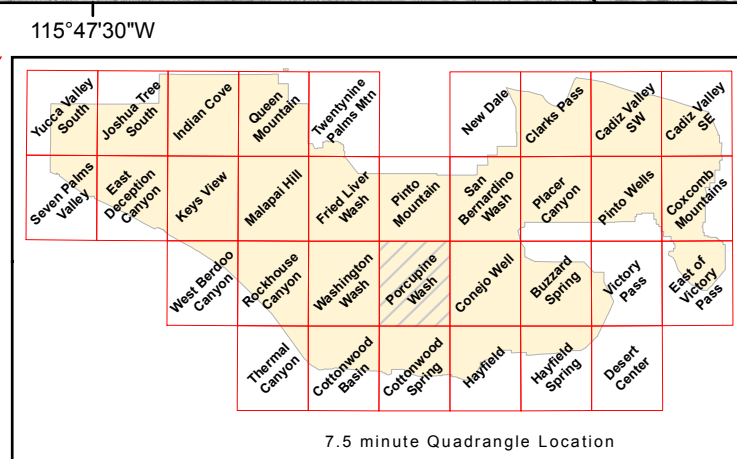
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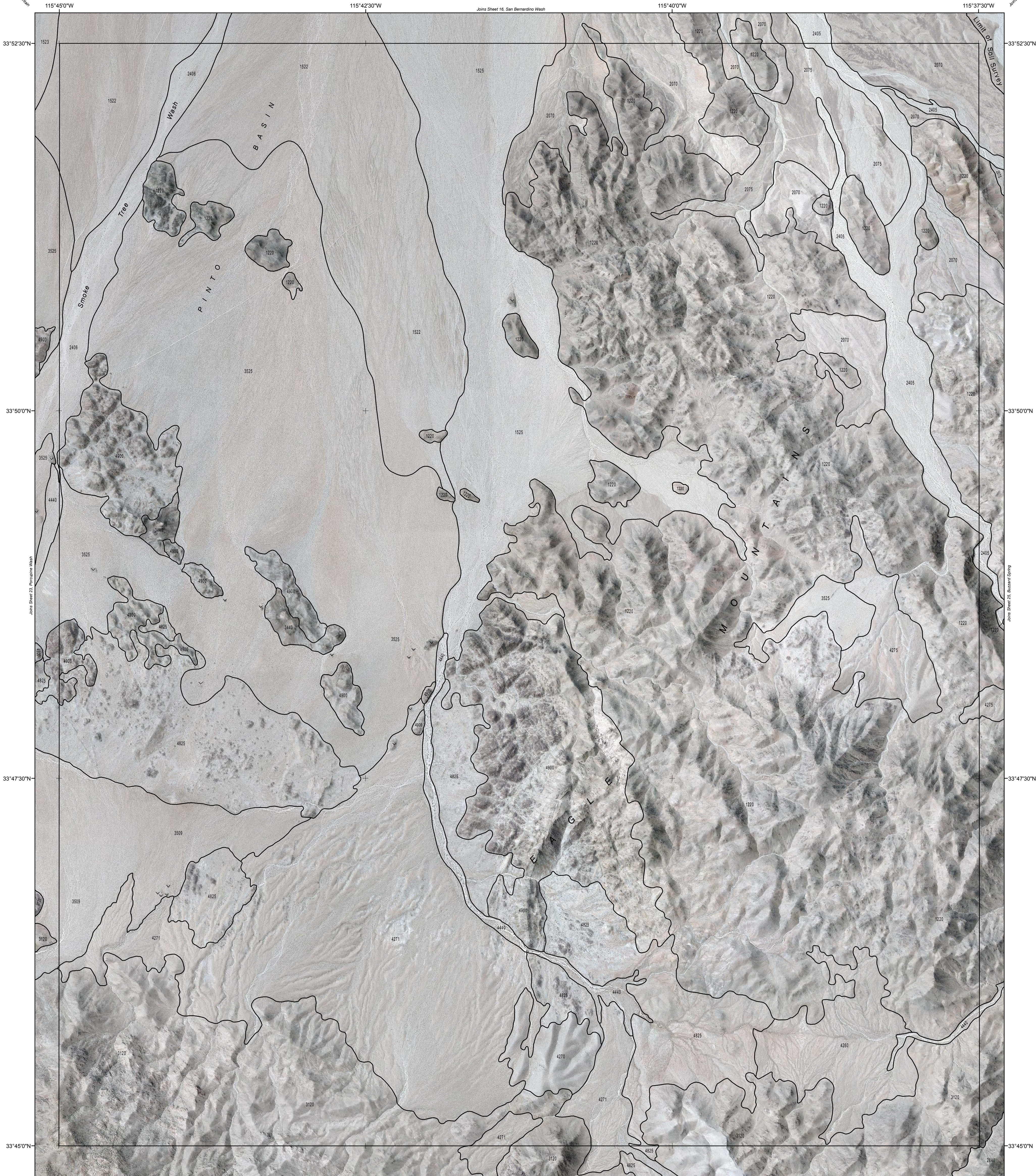
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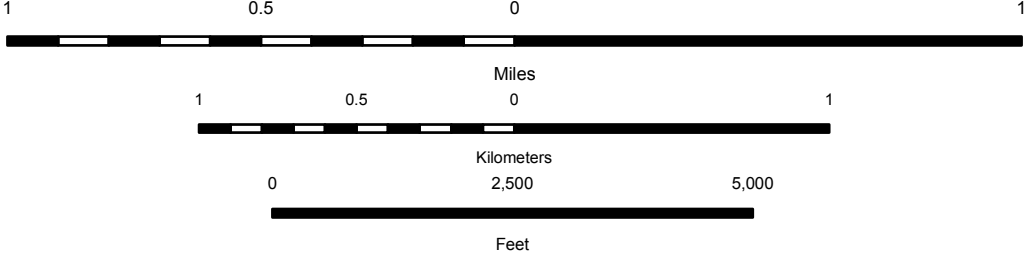
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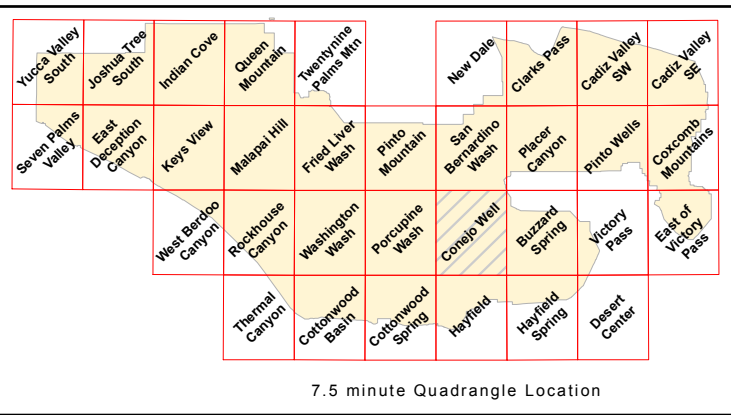
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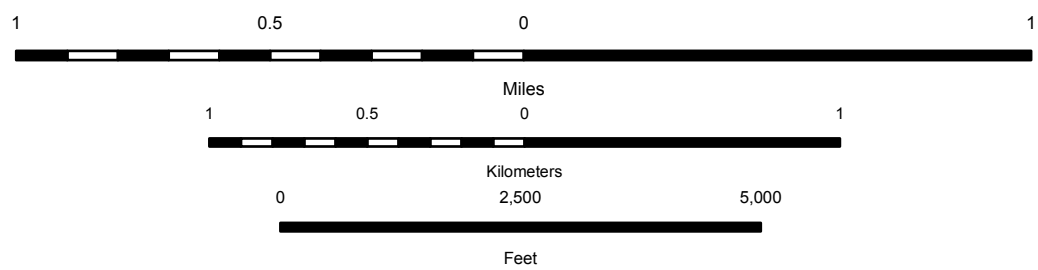


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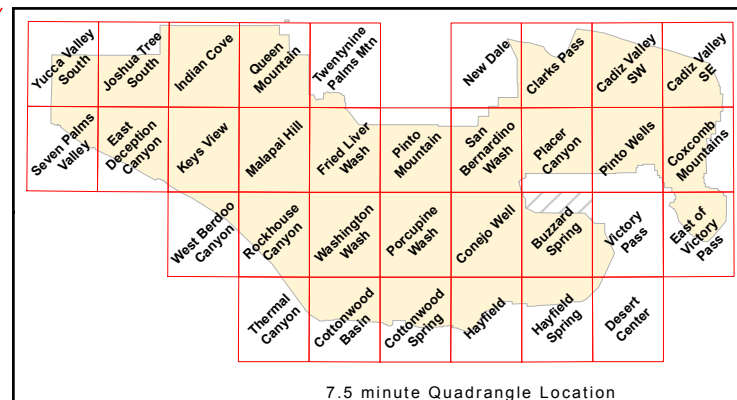
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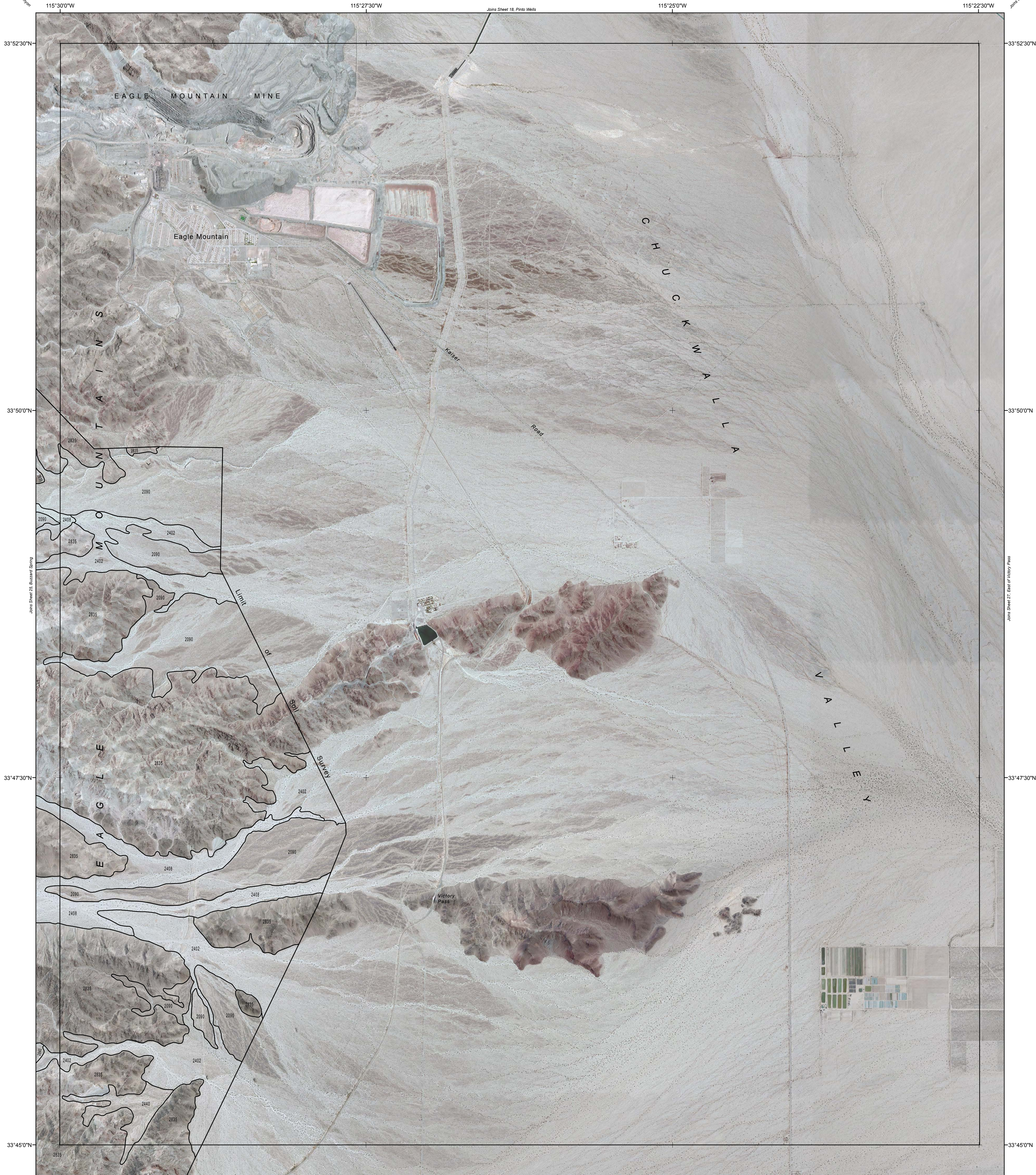
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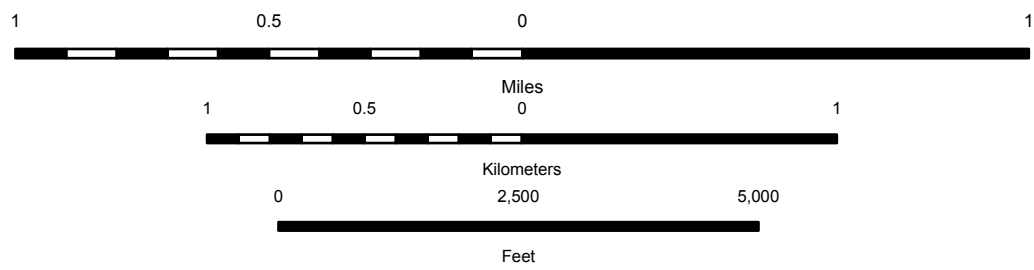


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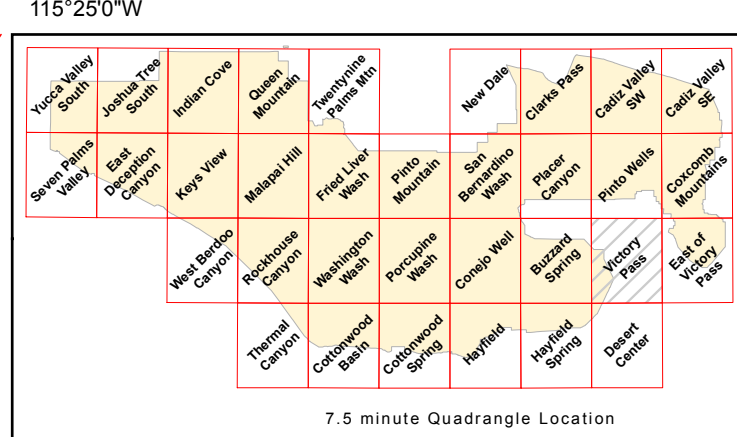
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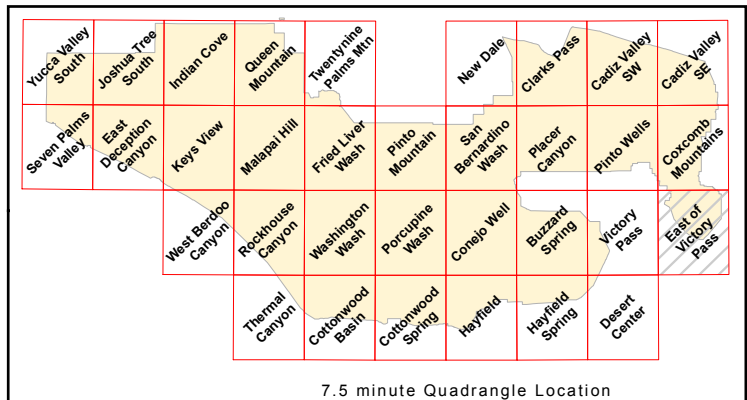
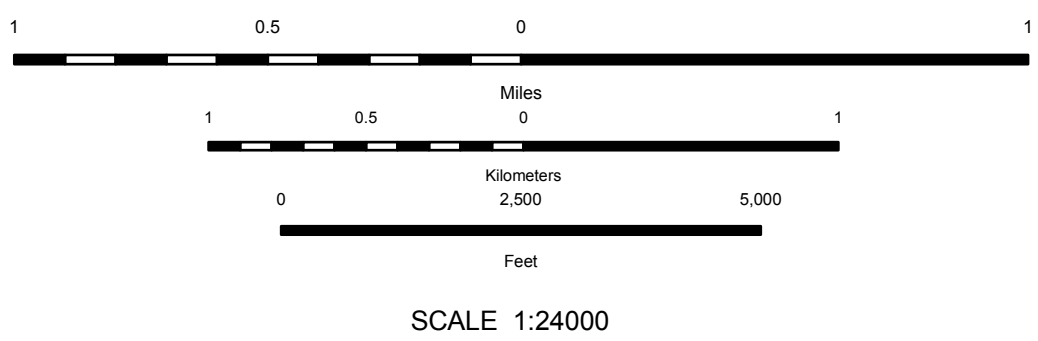


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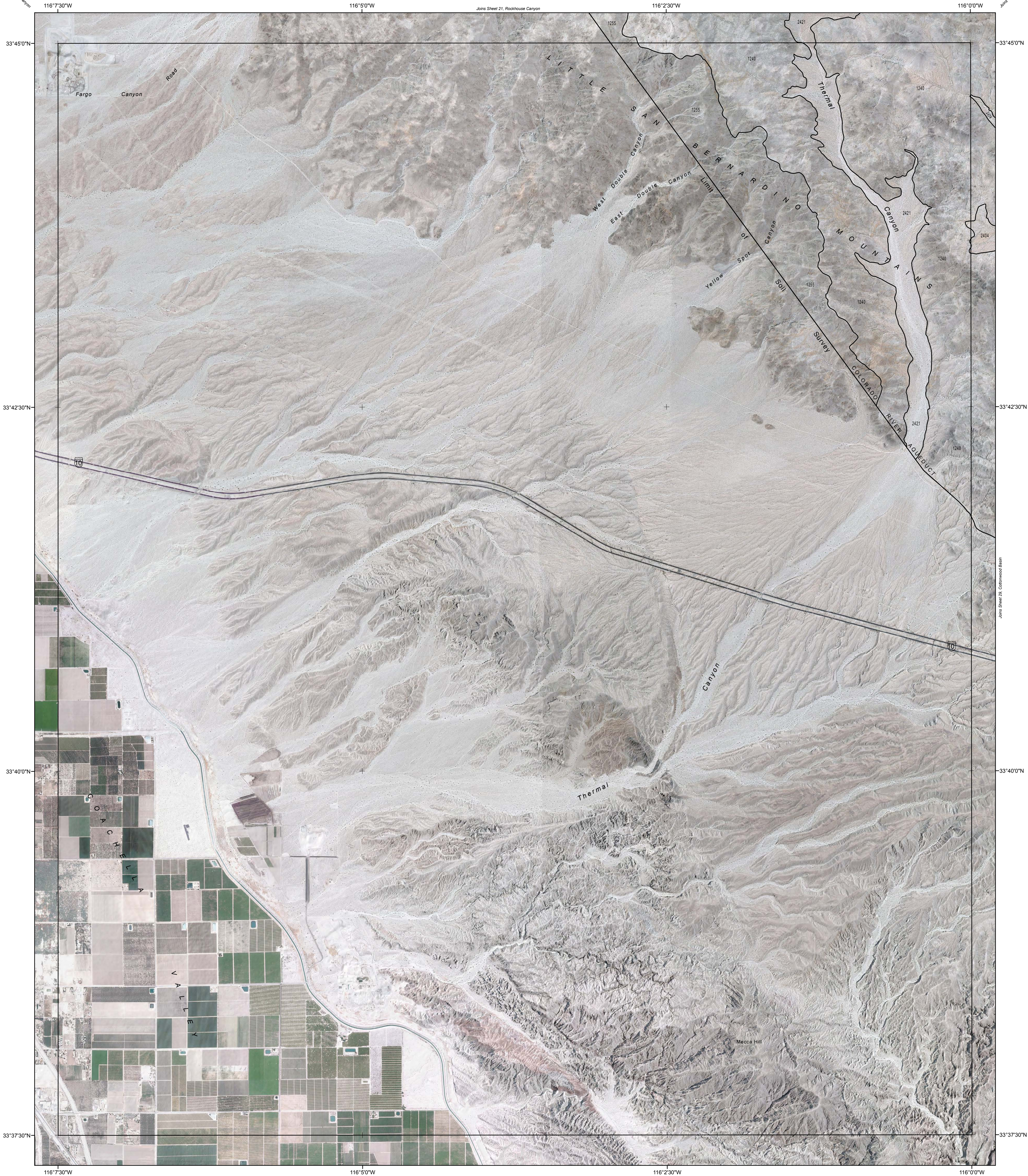
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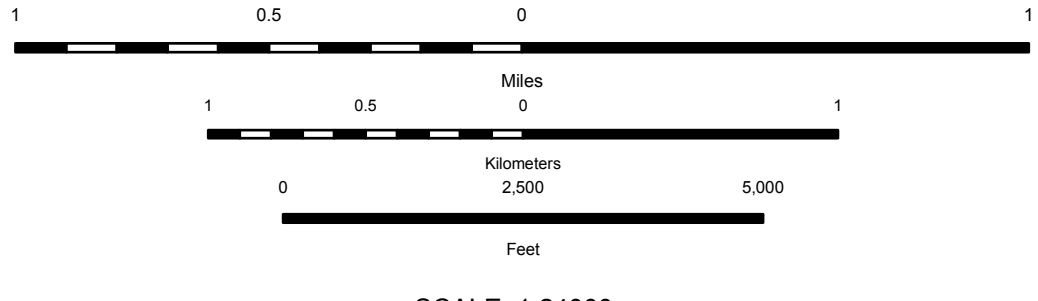


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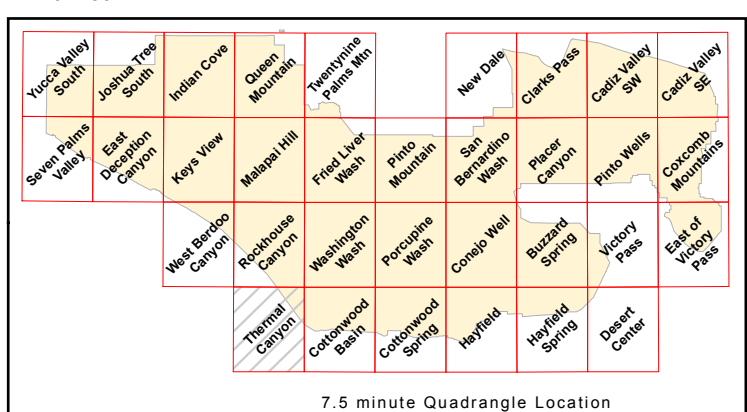
Aerial imagery derived from the National Agriculture Imagery Program (NAIP), 2010.

National Hydrography Dataset (NHD) and cultural features derived from data provided by the U.S. Department of Agriculture, Service Center Agencies.

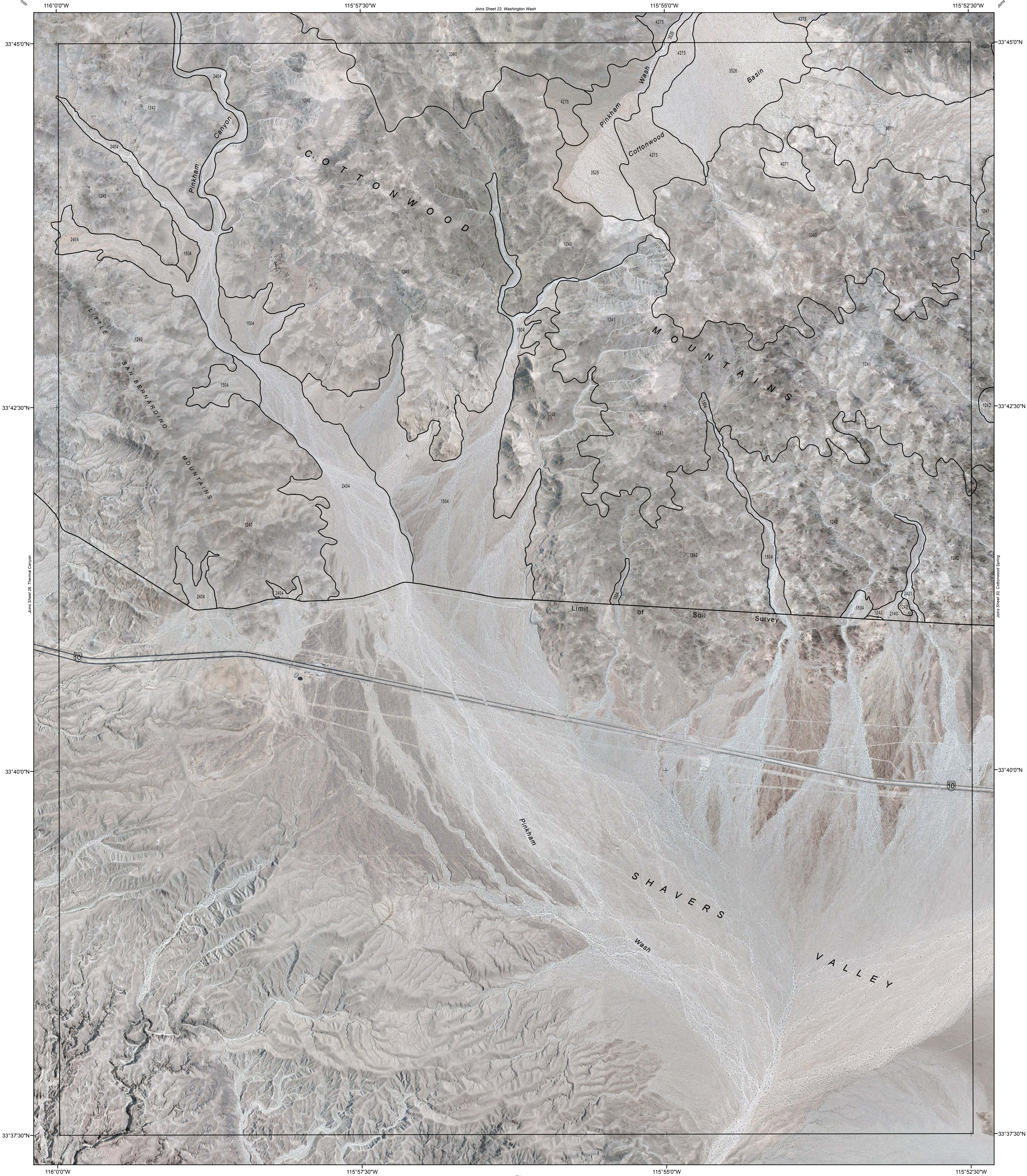
North American Datum of 1983 (NAD83).  
Universal Transverse Mercator (UTM) coordinate system, zone 11.



SCALE 1:24000





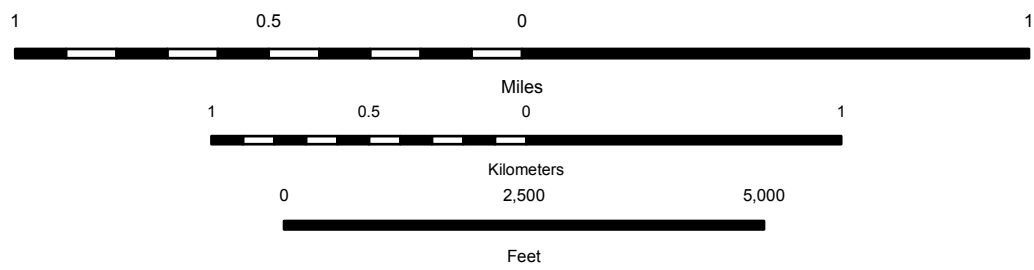


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service.

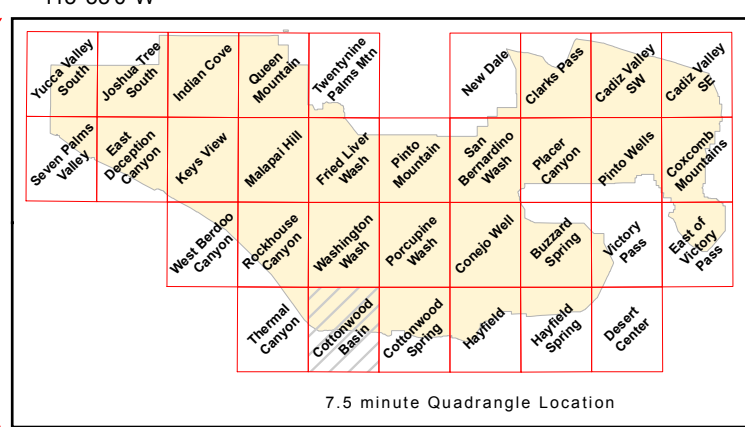
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National Hydrography Dataset (NHD) and cultural features derived from data provided by the U.S. Department of Agriculture, Service Center Agencies.

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Universal Transverse Mercator (UTM) coordinate system, zone 11.



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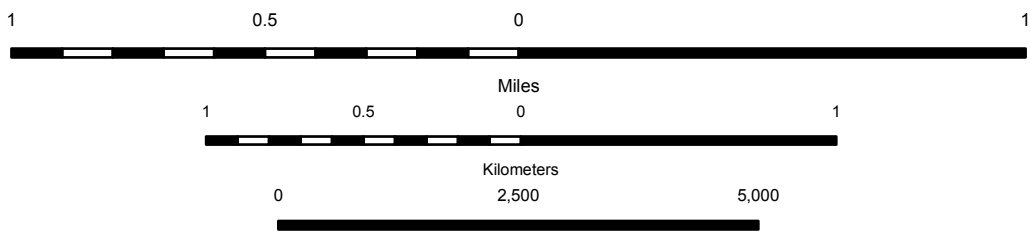


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service.

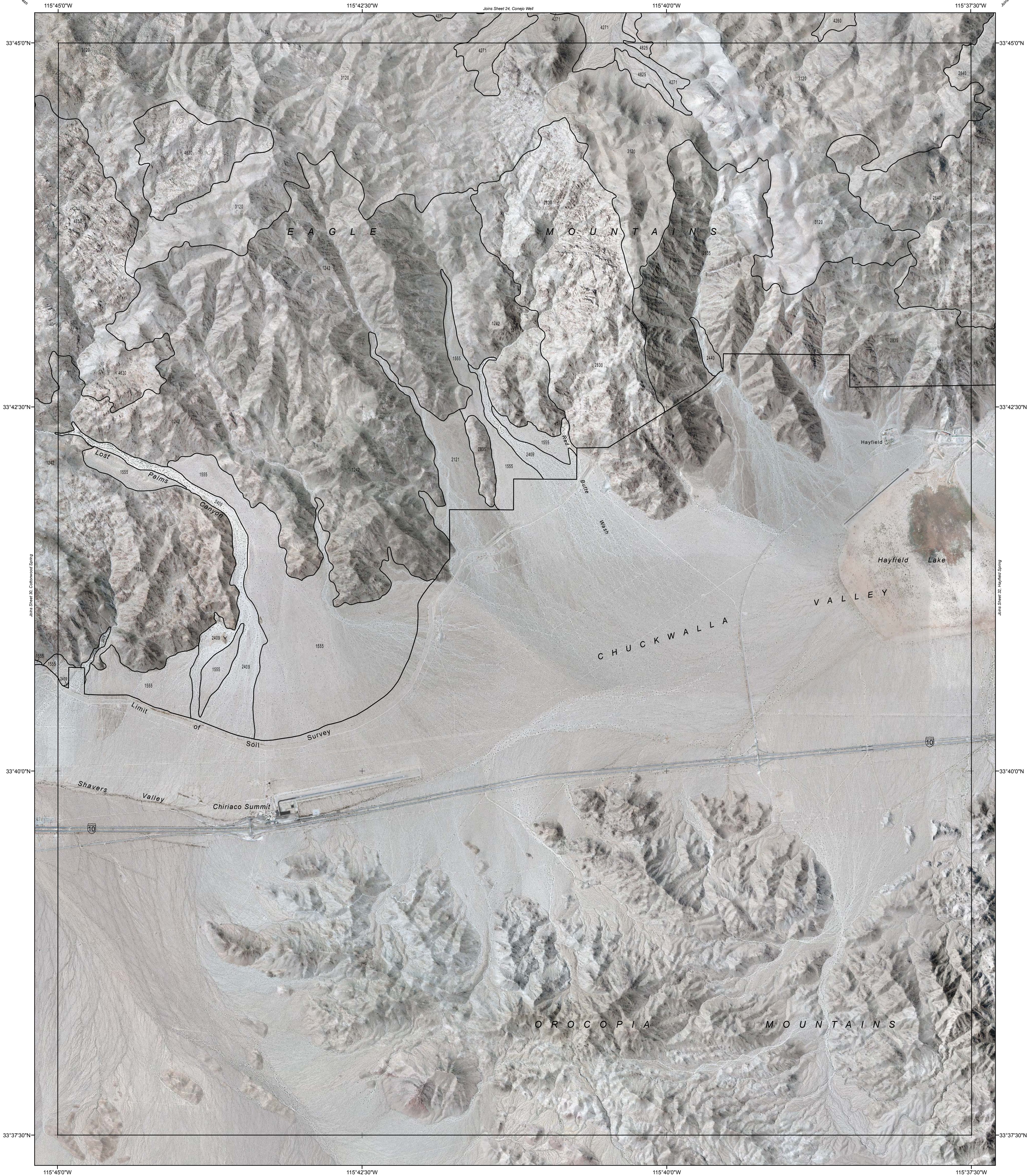
Aerial imagery derived from the National Agriculture Imagery Program (NAIP), 2010.

National Hydrography Dataset (NHD) and cultural features derived from data provided by the U.S. Department of Agriculture, Service Center Agencies.

North American Datum of 1983 (NAD83).  
Universal Transverse Mercator (UTM) coordinate system, zone 11.





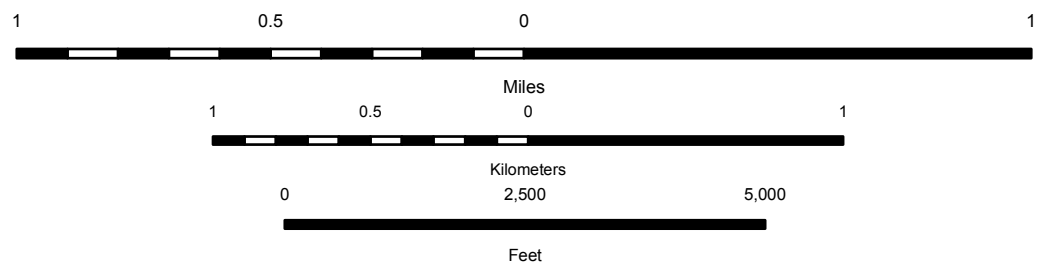


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service.

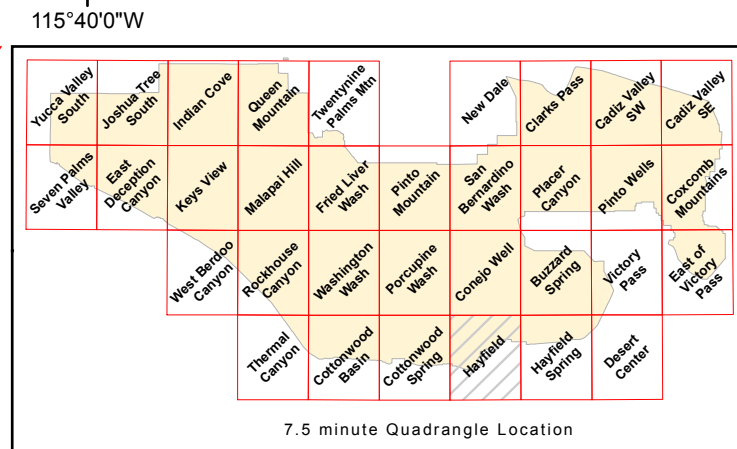
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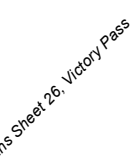
North American Datum of 1983 (NAD83).  
Universal Transverse Mercator (UTM) coordinate system, zone 11.



SCALE 1:24000







1 0.5 0 1

Miles

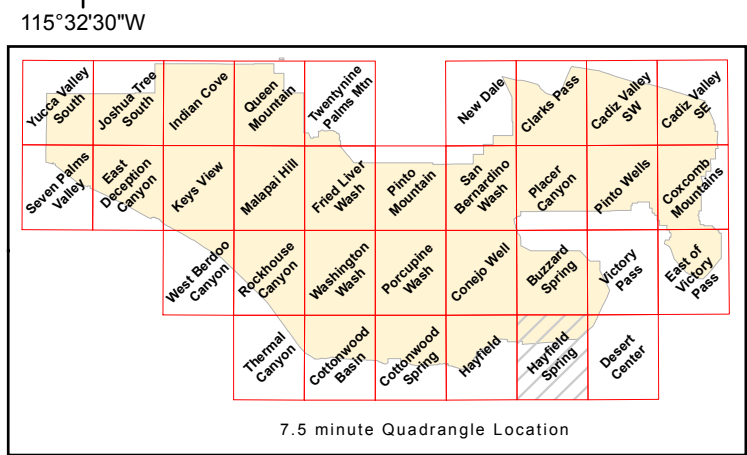
1 0.5 0 1

Kilometers

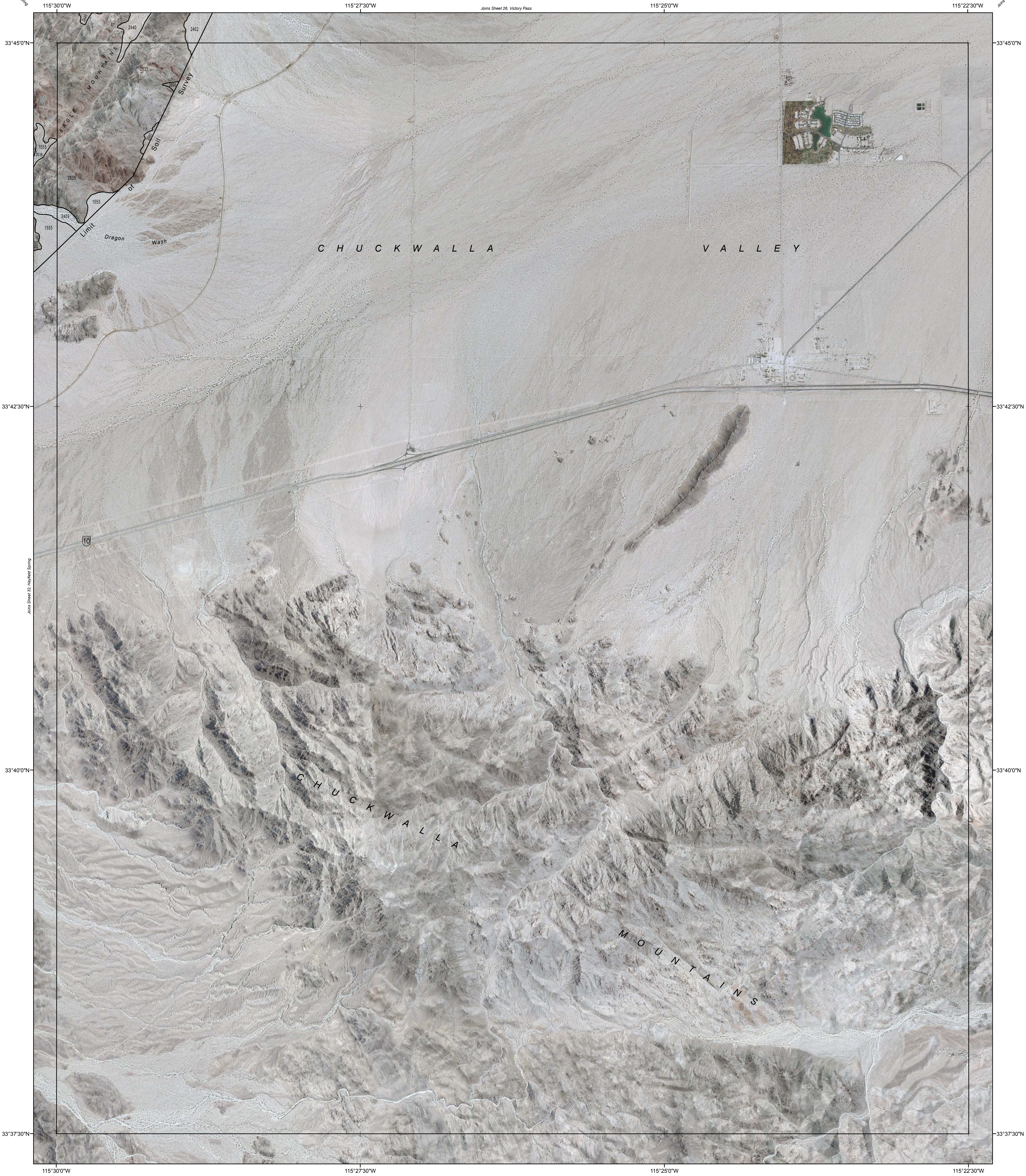
0 5,000

Feet

SCALE 1:24000







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National Hydrography Dataset (NHD) and cultural features derived from data provided by the U.S. Department of Agriculture, Service Center Agencies.

North American Datum of 1983 (NAD83).  
Universal Transverse Mercator (UTM) coordinate system, zone 11.

